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Dental Hygienist's Chairside
Pocket Guide

Renee Prajer
Gwen Grosso

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F. A. Davis's Notes Book



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BASICS

ASSESS

**MED COMP
PATIENTS**

MEDS

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Basics

Fundamental Principles of Dental Hygiene, Dental Hygiene Ethics, The Dental Hygiene Process of Care, Evidence Based Decision Making, Cultural Competence, Antibiotic Prophylaxis, American Heart Association Antibiotic Prophylactic Regimen (2007), Basic Life Support for the Health-care Provider, Occupational Exposure to Blood-Borne Pathogens, Infection Control, Dental Emergencies

Patient Assessment

Vital Signs, Patient/Risk Assessment, Extra-oral Examination, Intra-oral Examination, Documenting Lesions, Dentition, Occlusion, Malocclusion, G.V. Black's Classification of Caries, Periodontium, Classification of Periodontal Disease, Radiographic Survey

Medically Compromised Patients

Angina Pectoris, Anxiety Disorders, Asthma, Bleeding Disorders, Cancer, Cardiac Arrhythmias, Cardiac Pacemaker/ICD, Chronic Obstructive Pulmonary Disease (COPD), Congenital Heart Disease, Congestive Heart Disease, Diabetes Mellitus, Hepatitis, HIV/AIDS, Hypertension, Myocardial Infarction, Organ Transplant, Pregnancy, Prosthetic Replacements: Joint, Plates, Screws, Pins; Renal Failure, Seizure Disorder, Substance-Related Disorders, Tuberculosis

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Pain Management

Managing Dentin Hypersensitivity, Topical Anesthesia, Local Anesthetic Agents, Administration of Local Anesthesia, Complication Associated with the Delivery of Local Anesthesia

Oral Diseases

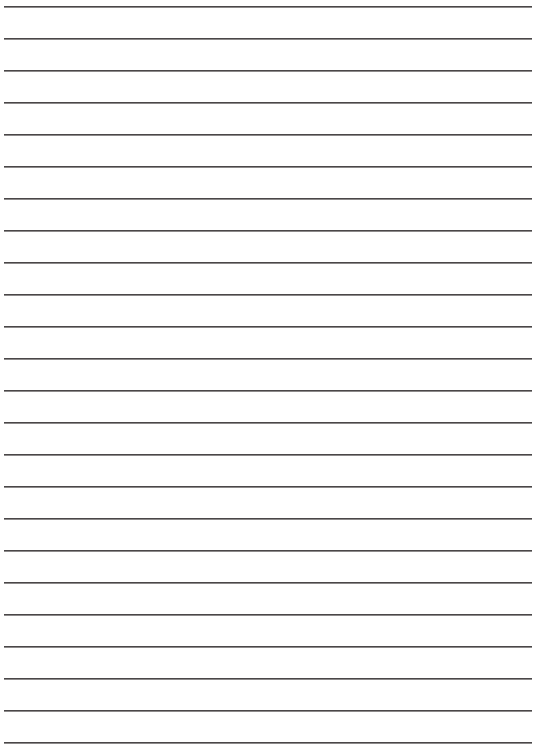
Red and Purple Lesions, Pigmented Lesions, Raised Papillary Lesions, Enlargements of Soft Tissue, Ulcerative Lesions, Vesicle Lesions, White Lesions

Instrumentation

Instrument Design Characteristics, Periodontal Instrumentation, Instrument Sharpening, Power-Driven Scaling Devices

Resources

Glossary, Common Dental Terminology, Spanish Terminology, Web Resources, Bibliography



Fundamental Principles of Dental Hygiene

The foundation for dental hygiene ethics originates from our fundamental principles. The American Dental Hygienists' Association Code of Ethics for Dental Hygienists defines the fundamental principles of our profession as follows.

Universality

The principle of universality assumes that if one individual judges an action to be right or wrong in a given situation, other people considering the same action in the same situation would make the same judgment.

Complementarity

The principle of complementarity assumes the existence of an obligation to justice and basic human rights. It requires us to act toward others in the same way they would act toward us if roles were reversed. In all relationships, it means considering the values and perspectives of others before making decisions or taking actions affecting them.

Ethics

Ethics are the general standards of right and wrong that guide behavior within society. As generally accepted actions, they can be judged by determining the extent to which they promote good and minimize harm. Ethics compel us to engage in health promotion/disease prevention activities.

Community

This principle expresses our concern for the bond between individuals, the community, and society in general. It leads us to preserve natural resources and inspires us to show concern for the global environment.

Responsibility

Responsibility is central to our ethics. We recognize that there are guidelines for making ethical choices and accept responsibility for knowing and applying them. We accept the consequences of our actions or the failure to act and are willing to make ethical choices and publicly affirm them.

Dental Hygiene Ethics

Ethics within the profession of dental hygiene is relative to conforming to what is professionally right or wrong. Dental hygienists are responsible for upholding the code of ethics set forth by the professional membership of which they are affiliated. The core values of the profession of dental hygiene are as follows:

- **Autonomy.**
 - Guarantee self-determination.
- **Confidentiality.**
 - Hold in confidence privileged information entrusted by the patient.
- **Societal trust.**
 - Ensure the trust that patients and society have in dental hygienists.
- **Beneficence.**
 - Doing good/benefit the patient.
- **Nonmaleficence.**
 - Do no harm to the patient.
- **Justice/fairness.**
 - Fairness and equality.
- **Veracity.**
 - Truthfulness and honesty.

The Dental Hygiene Process of Care

The dental hygiene process of care provides the framework of clinical dental hygiene practice and is a continuous cycle.

I. Assess.

Collection of both subjective and objective patient data.

II. Dental Hygiene Diagnosis.

Based on the overall assessment of the patient, the dental hygienist will identify the patient's oral health concerns.

III. Plan.

Treatment plan appropriate to meet the patient's needs.

IV. Implement.

Dental hygiene services are rendered.

V. Evaluate.

Outcomes are evaluated, the patient's needs are reassessed, and the process of care begins again.

Evidence-Based Decision Making

To stay current in the profession of dental hygiene and provide optimum care for patients, clinicians may employ the process of evidence-based decision making.

- Create a four-part PICO clinical question based on the need/problem.
 - Patient problem or population (the problem).
 - Intervention (the plan for the patient).
 - Comparison (an alternative option).
 - Outcome (the results you plan to accomplish).
- Complete a search to compile evidence regarding the need/problem.
 - Clinical applicability, appraise the evidence for its usefulness.

- Evaluate reliability of evidence.
- Incorporate findings into clinical practice.
- Evaluate the outcome.

Evidence-based decision making offers oral health-care providers a means for supporting clinical decisions.

Cultural Competence

As oral health-care providers, it is necessary to value the importance of culture in the delivery of care. Oral and overall health are influenced by one's culture and values. When treating patients of diverse backgrounds, the provider should take the following into consideration:

- Nonverbal communication. Direct eye contact or physical contact may be considered disrespectful to certain cultures.
- Verbal communication should be nonjudgmental to establish trust.
- Diseases/conditions that are influenced by the patient's ethnic background.
- Cultural behaviors that have an impact on oral and overall health.
- Identifying the decision maker when discussing treatment options.
- Cultural influences on proposed treatment plans.
- Beliefs/customs regarding pain management.
- Willingness to learn about the patient's culture and beliefs.

Antibiotic Prophylaxis

Patients with cardiac concerns and patients with total joint replacements are at greater risk of developing infections; therefore, they may require antibiotic prophylaxis. The American Heart Association (AHA) and the American Academy of Orthopaedic Surgeons (AAOS) have set guidelines for antibiotic prophylaxis.

AAOS Recommendations for Antibiotic Prophylaxis (2009)

Antibiotic prophylaxis is recommended for all patients who have undergone total joint replacement.

AHA Recommendations for Antibiotic Prophylaxis

The American Heart Association recommends antibiotic prophylaxis during dental procedures for patients with the following cardiac conditions:

- Prosthetic cardiac valve.
- Previous endocarditis.
- Congenital heart disease only in the following categories:
 - Unrepaired cyanotic congenital heart disease, including those with palliative shunts and conduits.
 - Completely repaired congenital heart disease with prosthetic material or device, whether placed by surgery or catheter intervention, during the first 6 months after the procedure.
 - Repaired congenital heart disease with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device.
 - Cardiac transplantation recipients with cardiac valvular disease.

! For patients who present with a cardiac condition previously noted, the AHA **RECOMMENDS antibiotic prophylaxis for the following dental procedures:**

All dental procedures that involve manipulation of gingival tissue or the periapical region of teeth, or perforation of the oral mucosa.

! For patients who present with a cardiac condition previously noted, the AHA **DOES NOT recommend antibiotic prophylaxis for the following dental procedures:**

Routine anesthetic injections through noninfected tissue; exposing dental radiographs; placement of removable, prosthodontic, or orthodontic appliances; adjustment of orthodontic

appliances; placement of orthodontic brackets; shedding of deciduous teeth; and bleeding from trauma to the lips or oral mucosa.

Patients who are not premedicated may receive antibiotic coverage within a 2-hour period if unexpected bleeding occurs and/or if during treatment the patient discloses additional medical history information that would indicate the need for premedication.

AHA Antibiotic Prophylactic Regimen (2007)

Standard Oral Prophylaxis

Amoxicillin

Adult dosage: 2.0 g orally 30–60 minutes before procedure.

Child dosage: 50 mg/kg orally 30–60 minutes before procedure.

If Patient Is Unable to Take Oral Medications

Ampicillin

Adult dosage: 2.0 g IM* or IV*.

Child dosage: 50 mg/kg IM or IV 30–60 minutes before procedure.

OR

Cefazolin or Ceftriaxone

Adult dosage: 1.0 g IM or IV.

Child dosage: 50 mg/kg IM or IV 30–60 minutes before procedure.

If Patient Is Allergic to Penicillin or Ampicillin

Cephalexin+**

Adult dosage: 2.0 g orally 30–60 minutes before procedure.

Child dosage: 50 mg/kg orally 30–60 minutes before procedure.

OR

Clindamycin

Adult dosage: 600 mg orally 30–60 minutes before procedure.

Child dosage: 20 mg/kg orally 30–60 minutes before procedure.

OR

Azithromycin or Clarithromycin

Adult dosage: 500 mg orally 30–60 minutes before procedure.

Child dosage: 15 mg/kg orally 30–60 minutes before procedure.

If Patient Is Allergic to Penicillin and Unable to Take Oral Medications

Cefazolin or ceftriaxone*

Adult dosage: 1.0 g IM or IV 30–60 minutes before procedure.

Child dosage: 50 mg/kg IM or IV 30–60 minutes before procedure.

OR

Clindamycin

Adult dosage: 600 mg IM or IV 30–60 minutes before procedure.

Child dosage: 25 mg/kg IM or IV 30–60 minutes before procedure.

*IM, intramuscular; IV, intravenous.

**Or other first or second generation oral cephalosporins in equivalent adult or pediatric dosage.

*Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema, or urticaria with penicillin or ampicillin.

Basic Life Support for the Health-care Provider

Check Responsiveness

Call 911: Activate the emergency medical system and obtain an automated external defibrillator (AED).

Airway

- Open airway using the head-tilt, chin-lift, or jaw thrust in trauma victims.

Breathing

- Assess breathing for 5 to 10 seconds by **looking** for the chest to rise and fall and **listening** and **feeling** for air from the nose and mouth.
- If the victim is not breathing, give two breaths (1 second each).
- If the breath does not go in, reopen the airway and attempt to ventilate. (If the breath still does not go in, assume airway obstruction.)

Circulation

- Assess pulse for 10 seconds.
- Adult and child: carotid.
- Infant: brachial.
- If a pulse is present, but no breathing, provide **rescue breaths**.
 - **Adult: 1 breath every 5–6 seconds** (10–12 breaths per minute).
 - **Child and infant: 1 breath every 3–5 seconds** (12–20 breaths per minute).
- If no pulse, begin chest compressions/cardiopulmonary resuscitation (CPR).

Adult CPR 30:2

- 30 compressions, 2 breaths.
- 1½ to 2 inches for depth of compressions.
- 100 compressions per minute.

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- Allow full chest recoil between compressions.
- Reassess after five cycles or approximately 2 minutes.

Child/infant CPR 30:2 one rescuer; 15:2 two rescuers

- 30 compressions, 2 breaths one rescuer.
- 15 compressions, 2 breaths two rescuers.
- 1/3 to 1/2 the depth of the chest.
- 100 compressions per minute.
- Allow full chest recoil between compressions.
- Reassess after five cycles or approximately 2 minutes.

Automated External Defibrillator (AED)

Early defibrillation is essential and increases the chance of survival when someone is in cardiac arrest.

- AED should be turned on and the health-care provider will follow the prompts of the AED unit.
- Adhesive pads are placed as instructed.
- All rescuers should “clear” the patient.
- Press the analyze button, allowing the AED to determine if a “shock is indicated.”
- Continue with CPR as prompted by the AED until the Emergency Medical Response team arrives.

AED Precautions

- AED may not be indicated or effective for patients less than 1 year of age.
- Proper pad size must be used.
- Patient must be dry.
- AED pads must not be placed over an implanted pacemaker or a transdermal medicated patch.
- Patient’s chest may need to be shaved for proper adhesion of electrode pads.

Obstructed Airway

Early recognition of an airway obstruction is essential for a successful outcome. An individual with a severe airway obstruction may experience the following signs and symptoms: inability to

speaking, poor or no air exchange, increased respiratory difficulty, cyanosis.

To relieve choking in adults and children, abdominal thrusts are employed using quick upward thrusts.

- Wrap your arms around the victim's waist.
- Place the thumb of your fist in the center of the victim's abdomen above the navel, yet below the breastbone.
- Using an upward motion, provide quick abdominal thrusts until the object is expelled from the airway or the victim goes unconscious.
- If the victim goes unconscious, begin the steps of CPR.

Oxygen Administration

Nasal Cannula

- Indicated for low-flow supplemental oxygen.
- 2–6 liters per minute/25%–40% oxygen delivery.

Face Mask

- Indicator for moderate levels of oxygen.
- 8–12 liters per minute/60% oxygen delivery.

Nonrebreather Mask

- Indicated for high levels of oxygen.
- 10–15 liters per minute/up to 100% oxygen delivery.

Bag Mask

- Indicated for manual ventilation when patient is not breathing/CPR.
- 10–15 liters per minute/90%–100% oxygen delivery.

Occupational Exposure to Blood-Borne Pathogens

In the dental setting, an exposure to blood-borne pathogens may occur. A percutaneous (needle stick or laceration) or per mucosal (splatter into the eye or mucosa) exposure to blood or bodily fluids that are potentially infectious are considered to be significant and should follow postexposure protocol.

Postexposure Protocol

- Express blood if possible.
- Wash affected area thoroughly with antimicrobial soap, rinse well.
- Exposures to eye or mucosa should be irrigated thoroughly with water or saline.
- Report the incident to the designated supervisor.
- Follow up with postexposure prophylaxis within 2 hours of exposure.
- With supervisor assistance, complete an incident report.
- Follow workplace postexposure protocols and procedures.
- Report any illness or symptoms that occur after the incident.

Infection Control

Standard precautions applied in clinical practice follow the theory that all patients receiving treatment are considered to be infectious.

Sterilization Methods

Chemical Vapor

Time: 20 minutes.

Temperature: 270°F/132°C.

Pressure: 20–40 psi.

Dry Heat

Time: 120 minutes; temperature: 320°F/160°C.

OR

Time: 60 minutes; temperature: 340°F/170°C.

Moist Heat (Steam Under Pressure)

Time: 15–30 minutes.

Temperature: 250°F/121°C.

Pressure: 15 psi.

Monitoring Sterilization

Indicator tape or markings on sterilization pouches are indicative that instruments have been run through a sterilization cycle. However, they DO NOT indicate that sterilization has been achieved. To ensure that sterilization has occurred, biologic monitoring should be performed on a regular basis.

Biologic Monitoring

Vials, ampules, or strips are packaged and run through a sterilization cycle. After the cycle is complete, the vial or ampule is placed in an incubator. The ampule or vial will change color during incubation indicating that sterilization has been achieved. The strip organisms are cultured and indicate sterilization if no growth occurs. Proper documentation of spore testing frequency and results should be recorded and maintained in the dental facility.

Dental Emergencies		
Emergency	Symptoms	Treatment
Abscess	Pain, swelling, pus drainage	Antibiotics, draining of infection, root canal treatment, or extraction
Avulsion	Tooth completely knocked out of sulcus	Reimplantation and splinting, do not wash tooth before reimplanting
Fracture	Pain, temperature sensitivity, pain upon percussion	Restoration, root canal treatment/ crown, possible need for extraction
Loose tooth due to trauma	Mobility	Splinting if tooth is salvageable, possible need for root canal treatment/ crown, or extraction

Continued

Dental Emergencies—cont'd

Emergency	Symptoms	Treatment
Pericoronitis	Swelling, soft tissue pain, bad taste from the area	Debridement of area, irrigation, possible need for antibiotics, and removal of tissue flap
Pulpitis, reversible	Pain associated with hot, cold, and/or sweet stimuli, spontaneous resolution	Restoration
Pulpitis, irreversible	Spontaneous or lingering pain that is difficult to isolate	Root canal treatment/crown or possible extraction
Sinusitis	Sensitivity involving several maxillary posterior teeth upon percussion or postural change, pain is most prominent in the morning and subsides throughout the day	Saline nasal irrigation, decongestants, antihistamines, possible need for antibiotics

Vital Signs

Pulse, respiration, and blood pressure (BP) are vital signs that are recorded before dental treatment. The purpose of obtaining vital signs in the assessment phase of treatment is to determine baseline readings, prevent emergencies from occurring, and make appropriate referrals when deemed necessary.

Pulse

The oral health-care provider may choose to take the patient's pulse at the following arteries: radial, carotid, or temporal.

Pulse rate should be palpated for 1 minute and recorded. Dental providers should assess for rate, rhythm, and strength.

Normal Pulse Rate Ranges

Age	Pulse Rate (bpm)
Adult (18+ years)	60–100
Adolescent (11–17 years)	60–100
Children (1–10 years)	60–140
Less than 1 year of age	100–160

bpm, beats per minute.

Tachycardia: Pulse rate greater than 100 for adults.

Bradycardia: Pulse rate less than 60 for adults.

Factors Affecting Pulse Rate

Increased Pulse Rate	Decreased Pulse Rate	Weak Pulse Rate
Exercise Stimulants Stress Alcohol Heart disease Fever Hyperthyroidism	Physical fitness Depressants Sleep Illness Hypothyroidism	Heart disease Blood clot Atherosclerosis

Respirations

Respirations should be taken by unannounced observation of the patient's chest rising and falling. One respiration is equivalent to the inhalation and exhalation of one breath.

Respirations should be counted for 1 minute and recorded. Dental providers should assess for rate, rhythm, depth, and ease of breaths.

Normal Respiration Ranges

Age	Respirations (breaths per minute)
Adult (18+ years)	12–20
Adolescent (1–17 years)	12–20
Children (1–10 years)	16–30
Less than 1 year of age	30–60

Factors Affecting Respirations

Increased Respirations	Decreased Respirations
Anxiety Exercise Pain Shock Medication	Cardiopulmonary disease Medication

Patients who experience anxiety in the dental setting may present with an increased respiratory rate that may lead to **hyperventilation** or **syncope**.

Hyperventilation

Hyperventilation decreases a patient's carbon dioxide levels as a result of excessive intake of oxygen.

Signs and symptoms of hyperventilation include the following:

- Rapid, deep breaths.
- Dizziness.
- Lightheadedness.
- Nausea.
- Tingling in the fingers and toes.

MANAGING HYPERVENTILATION

- Position patient upright.
- Reassure the patient.
- Instruct patient on diaphragmatic breathing.
- Monitor vital signs.
- DO NOT administer oxygen.
- If symptoms persist summon medical assistance.

Syncope

Syncope is a common dental emergency that involves a sudden, temporary loss of consciousness. Syncope is a result of insufficient blood flow to the brain.

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Signs and symptoms of syncope include the following:

- Weakness.
- Nausea.
- Pale coloring.
- Dilated pupils.
- Cold perspiration.
- Shallow breathing.

MANAGING SYNCOPE

- Place patient in the Trendelenburg position (toes above the nose).
- Open airway.
- Wave ammonia inhalant under patient's nose.
- Monitor vital signs.
- Administer oxygen.
- Reassure the patient.

Blood Pressure

Blood pressure is the force of circulating blood on the walls of the blood vessels. Systolic and diastolic readings should be obtained and recorded. The systolic reading reflects the pressure during ventricular contraction. The diastolic reading represents the pressure during ventricular relaxation.

! Blood pressure MUST NOT be taken on an arm with an implanted shunt/catheter or on the same side as a mastectomy.

Blood Pressure Classifications

Adult BP Classification	Systolic	Diastolic
Normal	<120 mm Hg	<80 mm Hg
Prehypertension	120–139 mm Hg	80–89 mm Hg
Stage 1 hypertension	140–159 mm Hg	90–99 mm Hg
! Stage 2 hypertension	≥160 mm Hg	≥100 mm Hg

Factors Affecting Blood Pressure

Increase Blood Pressure

Anxiety
Exercise
Stimulants
Medication

Decrease Blood Pressure

Fasting
Depressants
Medication

Patient/Risk Assessment

Patient assessment should include observations of the following:

Patient's Gait

- Balance.
- Coordination.

Physical

- Deformities.
- Body build.
- Posture.
- Hearing aids.
- Odors.
- Swelling of the ankles.

Skin/Nails

- Tattoos.
- Lesions.
- Scars.
- Bruising.
- Clubbing of the fingers.
- Nail coloring.

Facial Symmetry

- Eyes.
- Neck.

American Society of Anesthesiologists (ASA) Physical Status Classification System

The ASA Physical Status Classification System was established to determine a patient's physical status before selecting appropriate anesthetics.

ASA I:

- Patient is healthy.
- Patient is capable of walking up a flight of stairs or two city blocks without distress.

ASA II:

- Patient presents with a mild systemic disease, a significant health risk, or dental anxiety.
- Systemic disease does not interfere with daily life.
- Systemic disease is well-controlled.
- Patient can walk up a flight of stairs or two city blocks but may need to rest afterward.

ASA III:

- Patient presents with a severe systemic disease.
- Systemic disease interferes with daily life.
- Systemic disease is uncontrolled.
- Patient can walk up a flight of stairs or two city blocks but will need to stop and rest on the way.

ASA IV:

- Patient presents with a severe systemic disease that is life threatening.
- Patient is unable to walk up a flight of stairs or two city blocks.

ASA V:

- Patient is declining and is not expected to survive.

Risk Assessment

When obtaining a comprehensive medical history, the dental care provider should consider the following risks before rendering treatment:

- Antibiotic prophylaxis.
- Allergies.
- Anxiety.
- Anesthesia concerns.

- Bleeding.

- Chair position.

- Drug choice.
- Devices/prosthetics.

- Emergency probability.

- Follow-up questions/medical clearance.

Adapted from Little, J., Falace, D., Miller, C., & Rhodus, N. (2008). *Dental Management of the Medically Compromised Patient*, 7th ed. St.Louis: Mosby/Elsevier.

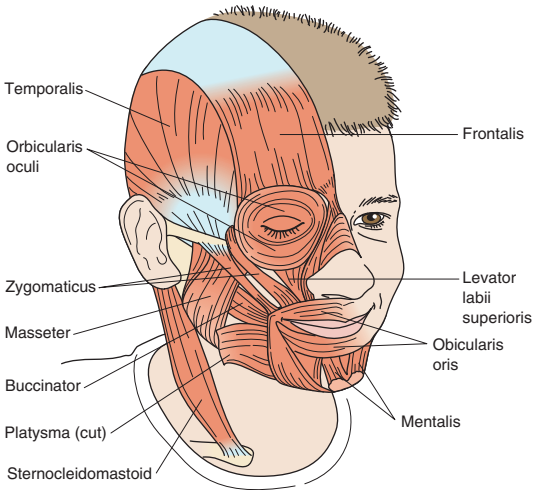
Extra-Oral Examination

Total patient care includes the thorough assessment of the head and neck region. The dental care provider should assess for abnormalities and make appropriate referrals.

Assess: The head and neck area, skin, muscles, salivary glands, lymph nodes, thyroid gland, clavicle, larynx, zygoma, and the temporal mandibular joint.

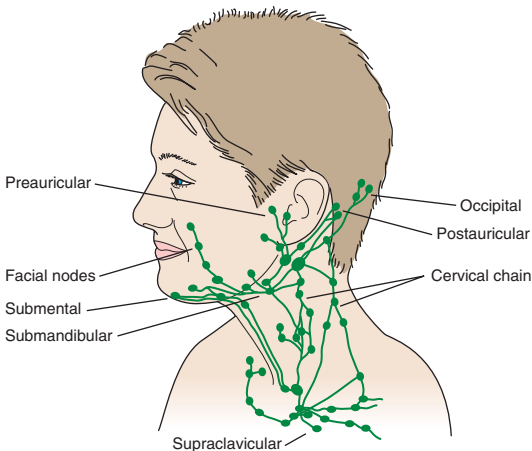
Muscles of Facial Expression

The muscles of facial expression are innervated by the VII (facial) cranial nerve.



Lymph Nodes of the Head and Neck

The lymphatic system plays a significant role in the immune function of the body. Lymph nodes that are palpable should be recorded, monitored, and referred.



Temporal Mandibular Joint/TMJ

The TMJ joint is responsible for articulation between the temporal bone and the mandible.

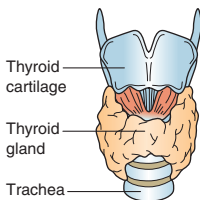
Subluxation: A dislocation due to opening the mouth too wide resulting in the inability to close; however, the contact between the joint surfaces remains.

Bruxism: Grinding, overuse of the muscles of mastication.

Crepitus: Noise or vibration felt when opening the mouth.

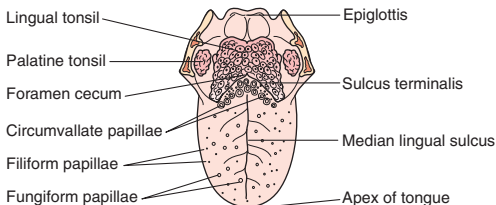
Thyroid Gland

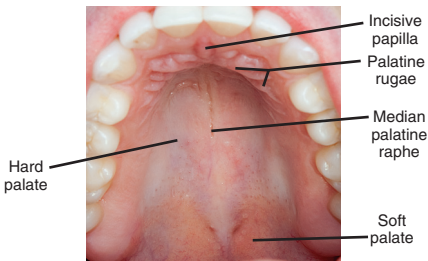
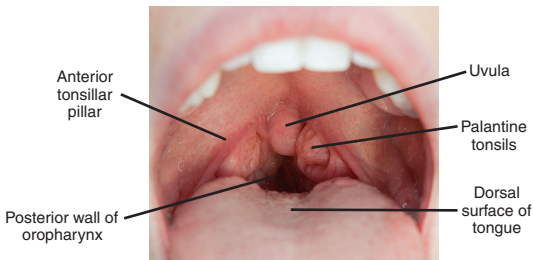
The thyroid gland is a part of the endocrine system, which secretes hormones that control metabolism. Disorders of the thyroid include hypothyroidism (underactive) and hyperthyroidism (overactive). During the extra-oral examination, the dental care provider should assess the size of the gland (goiter: enlarged thyroid gland), note any nodules or masses, and make appropriate referrals.



Intra-Oral Examination

Assess: Labial and buccal mucosa, salivary glands, tongue, hard and soft palate, oral pharynx, floor of the mouth.





Salivary Glands

The three paired major salivary glands and associated ducts should be evaluated for secretion during the oral examination.

Parotid Gland

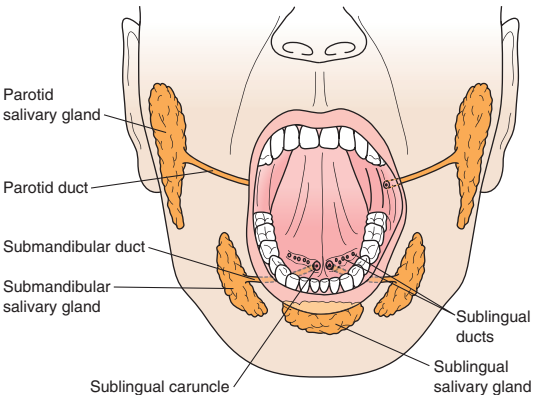
- Largest salivary gland.
- Produces 25% of salivary volume.
- Serous secretion.
- Saliva is secreted through the parotid duct.
- Tissue surrounding the parotid duct is the parotid papilla.

Submandibular Gland

- Produces 60%–65% of salivary volume.
- Serous and mucous secretion.
- Saliva is secreted through the submandibular duct.
- Tissue surrounding the submandibular duct is the sublingual caruncle.

Sublingual Gland

- Smallest major salivary gland.
- Produces 10% of salivary volume.
- Serous and mucous secretion, mostly mucous.
- Saliva is secreted through the sublingual duct.



Documenting Lesions

Lesion Characteristics

Location: Document location, provide drawing on chart.

Size/dimensions: Measured in mm documenting width, height, and depth.

Borders: Regular/irregular.

Color: Document color/s of lesion.

Texture:

- Corrugated.
- Crusted.
- Papillary.
- Fissured.

Consistency: Firm, soft, resilient.

Lesion Descriptors

Flat lesion: At the same level as the mucosa.

Depressed lesion: Below the level of the mucosa.

Macule: Lesion of color different than surrounding tissue.

Sessile base: Base as wide as the lesion.

Pedunculated base: Narrow base, stalk-like.

Fluid-filled Lesions

- Bulla: ≥ 1 cm in diameter.
- Vesicle: ≤ 1 cm in diameter.
- Pustule: Contains pus.

Solid Tissue Lesions

- Nodule: ≤ 1 cm in diameter.
- Papule: ≤ 5 mm in diameter.
- Tumor: ≥ 2 cm in diameter.
- Plaque: flat, wide slightly raised.

Assess and document the following:

If the lesion is mobile or fixed, palpable or nonpalpable, and whether or not the patient is experiencing tenderness at the lesion site.

Dentition

Patient assessment includes a thorough examination of the dentition.

Primary Dentition

Primary Eruption Dates

6½ to 8 months of age	Central incisors
7 to 9 months of age	Lateral incisors
12 to 16 months of age	First molars
16 to 21 months of age	Canines
21 to 30 months of age	Second molars

Permanent Dentition

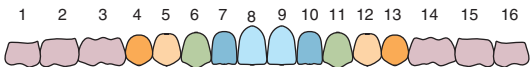
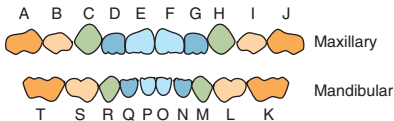
Permanent Eruption Dates

(based on years of age)

Maxillary	Mandibular
6 to 7 years first molar	6 to 7 years central incisor
7 to 8 years central incisor	6 to 7 years first molar
8 to 9 years lateral incisor	7 to 8 years lateral incisor
10 to 11 years first premolar	9 to 10 years canine
11 to 12 years canine	10 to 12 years first premolar
10 to 12 years second premolar	11 to 12 years second premolar
12 to 13 years second molar	12 to 13 years second molar
17 to 22 years third molar	17 to 22 years third molar

Permanent dentition

Maxillary

Primary
dentition

Permanent dentition

Mandibular



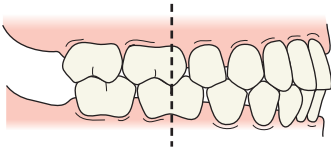
Occlusion

Occlusion refers to the relationship between the maxillary teeth to the mandibular teeth as they come together, or occlude.

Normal occlusion: All teeth in the maxillary arch are in maximum contact with all teeth of the mandibular arch. Maxillary teeth are slightly buccal/facial to the mandibular teeth.

Normal molar relationship: The mesiobuccal cusp of the maxillary first molar occludes with the buccal groove of the mandibular first molar.

Normal canine relationship: The maxillary canine occludes with the distal half of the mandibular canine and the mesial half of the mandibular first premolar.



Normal occlusion

Malocclusion

Malocclusion is any deviation from the normal occlusion.

Angle's Classification of Malocclusion

Class I Neutroclusion

Molar and canine relationship is normal; however, there is malposition of teeth.

Class II Distocclusion

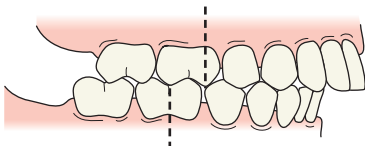
Molar relationship: Buccal groove of the mandibular first molar is distal to the mesiobuccal cusp of the maxillary first premolar by at least the width of a premolar.

Canine relationship: Distal surface of the mandibular canine is distal to the mesial surface of the maxillary canine by at least the width of a premolar.

Two divisions are included in Class II malocclusion.

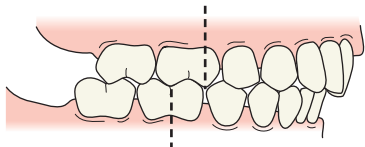
Class II Division 1

Mandible is retruded and maxillary incisors are protruded.



Class II Division 2

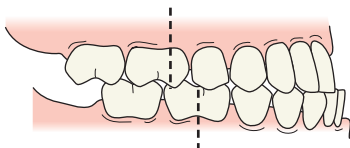
Mandible is retruded and one or more maxillary incisors are retruded.



Class III Mesioclusion

Molar relationship: Buccal groove of the mandibular first molar is mesial to the mesiobuccal cusp of the maxillary first molar by at least the width of a premolar.

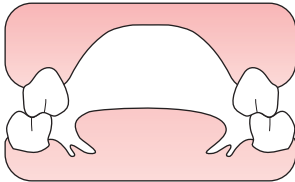
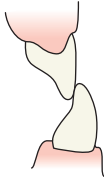
Canine relationship: The distal surface of the mandibular canine is mesial to the mesial surface of the maxillary canine by at least the width of a premolar.



Malrelation of Teeth

Crossbite

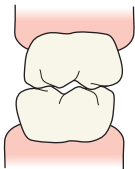
Anterior: Maxillary incisors are lingual to mandibular incisors.
Posterior: Maxillary or mandibular posterior teeth are excessively lingual or buccal to the norm.



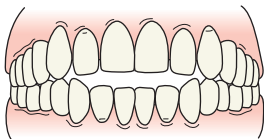
Edge to edge: Incisal surfaces occlude.



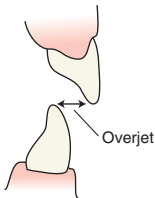
End to end: Cusp-to-cusp contact of molars and/or premolars.



Open bite: No incisal contact.



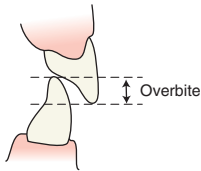
Overjet: Maxillary incisors are labial to mandibular incisors.



Overbite: The relationship between the incisal edge of the maxillary tooth to the facial surface of the mandibular tooth.

- Slight: Within incisal third.
- Moderate: Within middle third.
- Deep: Within the gingival third.

33



Underjet: Maxillary incisors are lingual to mandibular incisors.



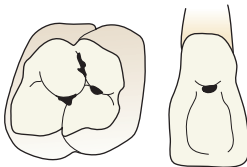
G. V. Black's Classification of Caries

Class I

Caries in pits and fissures.

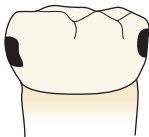
Occlusal and facial/lingual surfaces of premolars and molars.

Lingual surfaces of maxillary incisors.

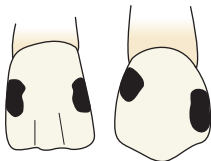


Class II

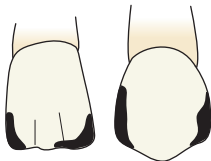
Caries in proximal surfaces of posterior teeth.

**Class III**

Caries in proximal surfaces of incisors and canines that do not involve the incisal edge.

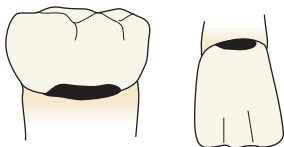
**Class IV**

Caries in proximal surfaces of incisors and canines that involve the incisal edge.



Class V

Caries in the cervical third.

**Class VI**

Caries on incisal edges or cusp tips.



Periodontium

The periodontium consists of tissues that support the teeth.

Free gingiva (marginal gingiva): Surrounding the tooth, unattached, forming the wall of the gingival sulcus.

Free gingival groove: A linear groove that separates the free and attached gingiva.

Gingival sulcus: The crevice between the free gingiva and the tooth. A healthy sulcus is 1.8 mm in depth.

Junctional epithelium: A band of tissue that encircles the tooth and forms the seal at the base of the gingival sulcus.

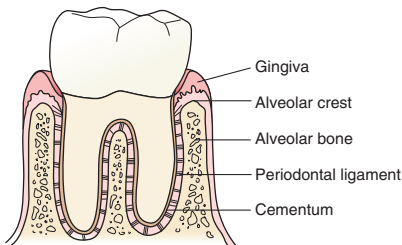
Interdental gingiva (interdental papilla): An area of tissue between two adjacent teeth.

Attached gingiva: Tissue that is bound to underlying structures.

Mucogingival junction: The area where the attached gingiva meets the alveolar mucosa.

Alveolar mucosa: Movable tissue, loosely attached to alveolar bone.

Alveolar bone: The portion of the maxilla and mandible that supports the alveoli.



Gingival Descriptors

Descriptor	Healthy	Disease
Color	Pale pink, coral, melanin pigmentation due to ethnicity	Acute: Red Chronic: Bluish red, cyanotic
Size	Conforms to tooth	Enlarged, easily deflected Edematous, Hyperplastic

Continued

Gingival Descriptors—cont'd

Descriptor	Healthy	Disease
Shape/contour	Marginal gingiva: Knife edged Papilla: Fills contact, pointed	Marginal gingiva: Rounded, rolled Papilla: Bulbous, blunted, cratered
Consistency	Firm	Spongy: Dents when pressed due to edema Fibrotic: Chronic inflammation Hyperkeratinized: White in appearance due to extrinsic factors, smoking, chewing tobacco
Bleeding	No bleeding upon probing	Bleeding on probing
Exudate	None	Purulent (pus)
Position	Gingival margin is 1–2 mm above the cementoenamel junction (CEJ)	Recession: Gingival margin is below the CEJ Enlarged gingival margin: may cover $\frac{2}{3}$ of clinical crown or greater

Gingival health may also be influenced by systemic illness, medications, or patient lifestyle.

In addition to documenting gingival descriptors, it also is necessary to describe the extent of inflammation by using the following terms.

Papillary: Inflammation involving the papilla.

Marginal: Inflammation involving the papilla and extending into the free gingiva.

Diffuse: Inflammation involving the papilla, free gingiva, and extending into the attached gingiva.

Classification of Periodontal Diseases

AAP/American Academy of Periodontology classification of periodontal disease.

Case Type I: Gingival Disease

Inflammation of the gingiva characterized clinically by changes in color, gingival form, position, surface appearance, and presence of bleeding and/or exudate.

Case Type II: Early Periodontitis

Progression of the gingival inflammation into the deeper periodontal structures and alveolar bone crest, with slight bone loss. There is usually a slight loss of connective tissue attachment and alveolar bone.

Case Type III: Moderate Periodontitis

A more advanced stage of the preceding condition with increased destruction of the periodontal structures and noticeable loss of bone support, possibly accompanied by an increase in tooth mobility. There may be furcation involvement in multirooted teeth.

Case Type IV: Advanced Periodontitis

Further progression of periodontitis with major loss of alveolar bone support usually accompanied by increased tooth mobility. Furcation involvement in multirooted teeth.

Mobility

Mobility: Measured by applying force buccolingually by placing blunt ended instruments on either side of a tooth and attempting to rock the tooth.

N = normal mobility.

1 = first distinguishable sign of movement.

2 = movement greater than 1 mm.

3 = movement greater than 2 mm and vertical displacement.

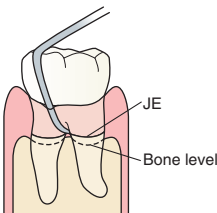
Furcation

Furcation: Region of a multirooted tooth at which the roots divide.

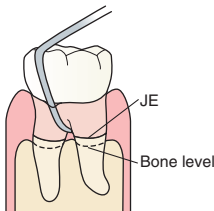
Furcation Involvement/Invasion: A pathological condition that has destroyed the periodontium in the intraradicular area of multirooted teeth.

Furcation Classification

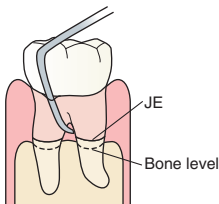
Class I: Incipient defects; the probe can enter the furcation area (less than 1 mm).



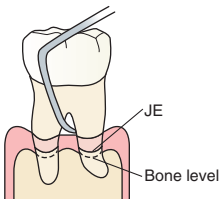
Class II: Soft tissue and bone loss that permits the probe to enter the furcation from one aspect but not pass completely through.



Class III: Extensive osseous destruction that permits through-and-through communication but the furcation is still covered by gingival tissue.



Class IV: A through-and-through furcation involvement that is clinically exposed from gingival recession.

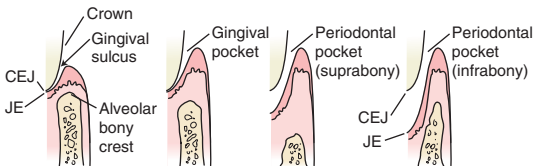


Classification of Pockets

Gingival (pseudopocket): Formed by gingival enlargement without bone loss or apical migration of the junctional epithelium.

Suprabony: Deepening of the gingival sulcus caused by apical migration of the junctional epithelium, however, the bottom of the pocket and junctional epithelium are coronal to the crest of the alveolar bone.

Infrabony: Deepening of the gingival sulcus in which the bottom of the pocket and junctional epithelium are apical to the crest of the alveolar bone.



Radiographic Survey

Clinical judgment should always be employed when determining the type and frequency of radiographs. The American Dental Association suggests the following:

- Recall patients (child/mixed/adolescent) with clinically detectable caries or an increased risk for caries; bitewing radiographs every 6–12 months.
- Adult recall patients with clinically detectable caries or an increased risk for caries; bitewing radiographs every 6–18 months.
- Recall patients (child/mixed dentition) with no clinically detectable caries; bitewing radiographs every 12–24 months.
- Recall patients (adolescent/permanent dentition) with no clinically detectable caries; bitewing radiographs every 18–36 months.
- Adult recall patients with no clinically detectable caries; bitewing radiographs every 24–36 months.

Additional information regarding frequency of radiographs can be found at www.ada.org.

Angina Pectoris

Angina is a transient symptom of discomfort in the chest and adjacent areas that results from inadequate oxygen flow to the myocardium.

Factors that may precipitate an angina attack include exertion, exercise, emotion, or a heavy meal.

Angina pectoris is generally precipitated with stress and controlled with rest. Symptoms include a feeling of burning, squeezing, and crushing tightness in the chest that radiates to the neck, shoulder, left arm, and mandible.

Angina pectoris may be classified as stable or unstable. Unstable angina is described as a new onset of pain (perhaps occurring at rest); pain that has increased in frequency, severity, and that is not easily controlled with nitroglycerin.

Medical History Follow-Up Questions for a Patient with Angina Pectoris

When was your last visit with your physician?

When were you diagnosed with angina pectoris?

Is your angina stable or unstable?

Do you have a history of angina attacks? If so, what are the frequency, severity, duration, and treatment of the attack?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Do you carry nitroglycerin tablets?

! Medical consultation with physician is recommended before emergency treatment for patients with unstable angina. Elective dental treatment should be postponed for patients with unstable angina.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings caused by prescribed medications. Refer to Meds tab.

- Reduce anxiety during appointment.
- Schedule appointments in the morning or early afternoon.
- Short appointments.
- Premedicate with an antianxiety agent.
- Terminate appointment if patient becomes fatigued.
- Position patient semi-upright (comfortable).
- Limit use of epinephrine.
- Have vasodilator available (nitroglycerin).
- Recognize signs and symptoms of an angina attack:
 - Squeezing chest pain radiating to the arm, neck, or shoulder.
 - Pale, fainting, sweating.
 - Difficulty breathing.

MANAGING AN EMERGENCY

An emergency may occur when treating a patient with angina pectoris. In the event of an angina attack the dental professional should:

- Have patient administer vasodilator (nitroglycerin).
- Monitor patient response.
- Mild headache: Suggests therapeutic dose was effective.
- Patients may receive up to 3 tablets in a 15-minute period.
- If symptoms persist after a second dose of the vasodilator (nitroglycerin), summon medical assistance.

Anxiety Disorders

Anxiety is defined as emotional pain, a feeling that all is not well, and/or a feeling of impending disaster. Anxiety may be unattached to a clearly identifiable cause. Common symptoms include shortness of breath, heart palpitations, trembling, and abdominal stress.

Medical History Follow-Up Questions for a Patient with an Anxiety Disorder

Do you have anxiety regarding dental treatment?

What dental hygiene procedures make you feel anxious?

What symptoms do you have when you feel anxious?

How has the anxiety been managed in the past?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Are you interested in taking medication before an appointment to reduce your anxiety?

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Discuss proposed treatment with patient.
- Allow patient to ask questions.
- Schedule morning appointments.
- Discuss anxiety relief options with patient.
- Premedicate with antianxiety medication.
 - Benzodiazepines are generally prescribed, common benzodiazepines include Xanax and Valium.
- Use nitrous oxide sedation.
 - Contraindicated for pregnancy and patients with emphysema.
- Limit use of epinephrine/levonordefrin.

Asthma

Asthma is an inflammatory disease of the lungs characterized by reversible airway obstruction. It is associated with recurrent episodes of dyspnea, coughing, and wheezing.

Medical History Follow-Up Questions for a Patient with Asthma

When was your last visit with your physician?

Age of onset?

What precipitates an attack?

When was your last asthma attack?

How often do you have attacks?

Do you have your inhaler with you today?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! Medical consultation is recommended for patients taking oral corticosteroids. (Patients may require a supplemental steroid dose when undergoing invasive procedures and/or may require antibiotic prophylaxis.)

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Always have the patient's rescue inhaler available in case of an emergency.
- Avoid aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs); these may precipitate an attack.
- Instruct patient to rinse with water after using inhalers to avoid tooth staining and taste alteration.
- Avoid use of fluoride varnish in patients who have been hospitalized as a result of their asthma.
- Avoid long periods of stressful procedures.
- Avoid macrolide antibiotics (erythromycin, azithromycin) or ciprofloxacin in patients who are taking theophylline (these antibiotics may cause toxic levels of theophylline).
- Beta 2 agonists (inhalers) and theophylline may cause gastroesophageal reflux resulting in enamel erosion.
- May elect to avoid local anesthetic solutions containing epinephrine and levonordefrin because they contain sulfites used as a preservative (sulfites can cause an allergic reaction).

- Provide a stress-free environment.
- Recognize signs and symptoms of an asthma attack:
 - Coughing.
 - Shortness of breath.
 - Chest tightness.
 - Wheezing.
 - Flushed, perspiration.
 - Confusion due to lack of O₂.
 - Inability to complete a sentence in one breath.

MANAGING AN EMERGENCY

An emergency may occur when treating a patient with asthma. In the event of an asthma attack:

- Sit patient upright to assist with breathing.
- Assist patient with the administration of their bronchodilator.
- Monitor patient response.
- Administer supplemental oxygen.
- If symptoms persist summon medical assistance.

Oral Findings	Recommendations
Enamel erosion	Fluoride rinses/custom trays, composite restorations, glass ionomer cement impregnated with fluoride
Extrinsic tooth staining	Rinse with water after using inhaler
Dysgeusia (bad taste)	Rinse with water, sugar-free mints
Fungal infections (candidiasis)	Topical/systemic antifungal agents (i.e., Clotrimazole troches)
Xerostomia	Saliva substitutes, xylitol/Biotene products, sipping water, prescription products such as Salagen, Sialor, sugarless lemon drops

Bleeding Disorders

Bleeding disorders may result from defects in blood vessels or from abnormalities in the blood. These disorders alter the ability of blood vessels, platelets, and coagulation factors to maintain hemostasis. The ability to control bleeding may be altered by drugs or disease. Moderate to excessive bleeding or prolonged bleeding may follow dental hygiene therapy, including nonsurgical treatment.

Diseases associated with bleeding disorders include, von Willebrand's, hemophilia A, hemophilia B (Christmas disease), and factor IX. Patients with chronic leukemia, liver disease, and renal failure also may have bleeding tendencies. Medications that may alter bleeding include Coumadin, heparin, aspirin, dipyridamole, and various herbal supplements.

Medical History Follow-Up Questions for a Patient with a Bleeding Disorder

Is your bleeding disorder the result of a disease? If so, what disease?

Have you received dental treatment since your diagnosis?

How was your bleeding disorder managed for dental treatment?

Is your bleeding disorder the result of taking an anticoagulant medication?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

How often do you have your clotting time determined?

Are you currently taking aspirin or herbal supplements?

! Medical consultation with the patient's physician is recommended for patients with bleeding disorders.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Patients who are on heparin, dipyridamole, and Coumadin therapy are at risk for increased bleeding with dental treatment, consultation with the physician is necessary before initiating treatment.
- Local hemostatic measures also should be employed as needed.
- Patients must be instructed to have meticulous oral hygiene.
- Avoid aspirin, aspirin-containing products (Fiorinal, Bufferin, and Excedrin), and NSAIDs; acetaminophen may be used.

Cancer

Cancer is an uncontrolled growth of neoplastic cells. Neoplasms are abnormal tissues that grow by cellular proliferation. Malignant neoplasms are commonly treated with chemotherapy, radiation therapy, and/or surgical intervention.

Medical History Follow-Up Questions for the Patient with Cancer

When were you diagnosed with cancer?

What type of cancer do you have?

Are you currently undergoing chemotherapy and/or radiation treatment?

When was your last treatment?

Have you noticed any oral side effects from the chemotherapy or radiation?

Do you have an indwelling catheter or port?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! Medical consultation is recommended for patients currently undergoing chemotherapy or radiation. (Because of immunosuppression.)

! Medical consultation is recommended for patients with an indwelling catheter or port. (Due to possible need for antibiotic prophylaxis.)

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Oral infections should be eliminated before the start of cancer therapy.
- Routine dental hygiene care should be delayed until cancer therapy is complete.
- Custom fluoride trays for patients scheduled for head and neck radiation.
- Recognize the possibility of trismus (jaw spasms) in patients who may have received radiation therapy delivered to the facial area.

Oral Findings	Recommendations
Enamel erosion (from vomiting)	Fluoride rinses, instruct patient to rinse with sodium bicarbonate and water after vomiting
Fungal infections (candidiasis)	Topical/systemic antifungal agents (i.e., Clotrimazole troches)
Mucositis	Salt/water rinses, combined prescription of viscous lidocaine/Benadryl/Kaopectate, or Benadryl/Maalox/nystatin elixir, soft diet
Radiation caries	Custom fluoride trays
Xerostomia	Saliva substitutes, xylitol/Biotene products, sipping water, prescription products such as Salagen, Sialor, sugarless lemon drops

Cardiac Arrhythmias

Cardiac arrhythmias are defined as any variation in the normal rhythm of the heartbeat and are associated with healthy and diseased hearts.

- Normal: 60–100 beats per minute.
- Tachycardia: More than 100 beats per minute.
- Bradycardia: Less than 60 beats per minute.

Common arrhythmias include the following:

- Bradycardia.
- Tachycardia.
- Atrial fibrillation.
- Premature ventricular contractions (PVCs).
- Ventricular fibrillation.
- Heart block.

Medical History Follow-Up Questions for a Patient with a Cardiac Arrhythmia

When was your last visit with your physician?

When were you diagnosed with a cardiac arrhythmia?

What type of arrhythmia do you have?

Is your arrhythmia asymptomatic or symptomatic?

Are you or have you been treated for your arrhythmia? If so, what type of treatment did you receive?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! Medical consultation with physician is recommended for patients taking blood thinners such as Coumadin/warfarin. (INR “International Normalized Ratio” should be less than 3.0 and PT “Prothrombin Time” should fall in normal range, which is 11–15 seconds.)

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Reduce anxiety during appointment.
- Morning or early afternoon appointment.
- Short appointments.
- Terminate appointment if patient becomes fatigued.
- Limit use of epinephrine.
- Patients with pacemakers: (see Cardiac Pacemaker, next)
- Patients taking digoxin: Avoid epinephrine or levonordefrin.

MANAGING AN EMERGENCY

An emergency may occur during the appointment with a patient who has a cardiac arrhythmia, the dental care provider should:

- Activate the emergency medical system.
- Obtain medical emergency equipment including an automated external defibrillator (AED) if available.
- Administer supplemental oxygen.
- Position the patient for CPR.
- Monitor vital signs.

Cardiac Pacemaker/ICD

A cardiac pacemaker is an electronic battery-operated device that transmits electrical impulses to stimulate a regular heart beat. A pacemaker may work on demand, when the pacemaker senses a disturbance in heart rate, or at a fixed rate if the pacemaker is preset to stimulate the heart when the natural heart beat is too slow. Pacemaker models and their sensitivity to electromagnetic interference vary.

An ICD is an implanted cardioverter-defibrillator. The ICD is similar to a cardiac pacemaker. An ICD is capable not only of delivering a

shock, but can provide antitachycardia pacing (ATP) and ventricular bradycardia pacing.

Medical History Follow-Up Questions for a Patient with a Cardiac Pacemaker/ICD

When was your last visit with your physician/cardiologist?
When was your pacemaker/ICD placed?
What was the cause for you to have a pacemaker/ICD placed?
What type of pacemaker do you have? Is it shielded?
Has your pacemaker/ICD ever had a malfunction?
Has the battery on your pacemaker/ICD ever been replaced?
If so, when?
Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.
Do you take your medications regularly?

! Medical consultation is recommended if further cardiac history details are needed. The use of antibiotic prophylaxis will be based on the patient's cardiovascular history. Consultation with the patient's cardiologist or pacemaker manufacturer is recommended before the use of equipment that may cause electromagnetic interference (ultrasonic scaler).

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Reduce stress.
- Short appointment.
- Use semi-supine or upright chair position.
- Avoid use of equipment that may cause electromagnetic interference on or nearby the patient unless clearance was obtained.

MANAGING AN EMERGENCY

An emergency may occur, when treating a patient who has a cardiac pacemaker/ICD. In the event of an emergency, the dental care provider should:

- Activate the emergency medical system.
- Disconnect all possible causes of electromagnetic interference.
- Obtain medical emergency equipment including an automated external defibrillator (AED) if available.
- Administer supplemental oxygen.
- Position the patient for CPR.
- Monitor vital signs.

Chronic Obstructive Pulmonary Disease (COPD)

COPD is a general term for pulmonary disorders characterized by chronic irreversible airflow limitation from the lungs. Cigarette smoking is the most common cause of COPD. The two most common forms of COPD are bronchitis and emphysema.

Medical History Follow-Up Questions for a Patient With COPD

When was your last visit with your physician?

Do you smoke? If so, how frequently?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Do you experience upper respiratory infections? Frequency?
Date of last infection?

Do you have a chronic cough?

! Medical consultation is recommended for patients taking oral corticosteroids. (Patients may require a supplemental steroid

dose when undergoing invasive procedures and/or may require antibiotic prophylaxis.)

! Patients with unstable COPD (shortness of breath, cough, and low oxygen levels) should be rescheduled when COPD is stable.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Use upright chair position or semi-supine position.
- Local anesthetic as usual, but avoid bilateral mandibular blocks.
- Avoid use of rubber dam.
- Avoid use of ultrasonic scaler.
- Avoid nitrous oxide sedation.
- Avoid macrolide antibiotics (erythromycin, azithromycin) or ciprofloxacin in patients who are taking theophylline. These antibiotics may cause toxic levels of theophylline.

MANAGING AN EMERGENCY

An emergency may occur when treating a patient with COPD. In the event of an emergency, the dental care provider should:

- Sit patient in a semi-supine to upright position.
- Monitor patient response and vital signs.
- Administer low-flow supplemental oxygen (2–4 L/min); too much oxygen may cause apnea (absence of respiratory movement).
- If symptoms persist summon medical assistance.

Oral Findings	Recommendations
Extrinsic tooth staining	Rinse with water
Fungal infections	Topical/systemic antifungal agents (i.e., Clotrimazole troches)
Increase in periodontal disease and caries	Frequent professional prophylaxis, proper oral hygiene and nutritional counseling, fluoride
Nicotine stomatitis	Smoking cessation
Oral cancer	Accurate documentation of size and location of lesion and appropriate referral
Xerostomia	Saliva substitutes, xylitol/Biotene products, sipping water, prescription products such as Salagen, Sialor, sugarless lemon drop

Congenital Heart Disease

Congenital heart disease is a structural or functional abnormality or defect of the heart existing from birth. Congenital heart defects may result from genetic or environmental factors or both.

Medical History Follow-Up Questions for a Patient with Congenital Heart Disease

When was your last visit with your physician?

When were you diagnosed with a congenital heart defect?

Do you know the name of the defect?

Did you undergo any surgeries for the heart defect? If so, when?

Do you see a cardiologist? If so, when was your last visit?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Have you ever been premedicated for dental procedures?

! Medical consultation is recommended for patients with a history of congenital heart disease. Antibiotic prophylaxis according to the American Heart Association.

Common Congenital Heart Defects

- Ventricular septal defect.
- Patent ductus arteriosus.
- Atrial septal defect.
- Transposition of the great vessels.
- Tetralogy of Fallot.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Prevention of infective endocarditis.
- Recognize the possibility of fatigue, cyanosis of lips and nail beds, poor growth and development, heart murmurs, and congestive heart failure.
- Provide oral hygiene instructions and stress the importance of optimum biofilm removal.

Congestive Heart Failure

Congestive heart failure is caused by the inability of the heart to function efficiently as a pump to meet the needs of the body. The heart continues to work, but is “failing” to work efficiently.

Medical History Follow-Up Questions for a Patient with Congestive Heart Failure

When was your last visit with your physician/cardiologist?
When were you diagnosed with congestive heart failure?
Do you have a history of heart valve damage?
Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Do you take your medications regularly?

Do you experience difficulty breathing?

Do you ever require the administration of supplemental oxygen?

! Medical consultation may be required depending on patient's cardiovascular history and severity of disease.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Reduce stress.
- Short appointment.
- Use semi-supine or upright chair position.
- Make chair position changes slowly.
- Observe for orthostatic hypotension.
- Digitalis drugs may exaggerate the patient's gag reflex.
- Recognize signs and symptoms of congestive heart failure:
 - Dyspnea (shortness of breath).
 - Orthopnea (shortness of breath while lying down).
 - Clubbing of the fingers.
 - Peripheral edema, swollen ankles.
 - Ascites (abdominal swelling, increase in fluid).
 - Cyanosis (blue).

MANAGING AN EMERGENCY

An emergency may occur when treating a patient with congestive heart failure; in most cases the patient is conscious. In the event of an emergency, the dental professional should:

- Sit the patient upright to assist with breathing.
- Activate the emergency medical system.
- Administer oxygen.
- Monitor vital signs.
- Prepare to perform basic life support.

Diabetes Mellitus

Diabetes mellitus is a chronic metabolic disease characterized by hyperglycemia caused by an absolute or relative deficiency of insulin.

Medical History Follow-Up Questions for a Patient With Diabetes

When was your last visit with your physician?
 When were you diagnosed with diabetes?
 What type of diabetes do you have?
 How frequently do you test your blood glucose?
 What type of blood glucose test do you take?
 What was your last blood glucose level reading? Does it fluctuate?
 Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.
 When did you last eat and what did you have?
 Do you experience hypoglycemia? If so, when was your last incident?
 Do you know your latest glycated hemoglobin assay (HbA1c) level?

Blood Glucose Ranges	FPG*	PP*	HbA1c*
Healthy, well controlled	<126 mg/dL	<160 mg/dL	<6%
Moderately controlled	<160 mg/dL	160–200 mg/dL	6%–7%
Uncontrolled!	>160 mg/dL	>200 mg/dL	≥8%

*FPG, fasting plasma glucose test taken after 8 hours of fasting.

PP, postprandial test taken after consuming a meal.

HbA1c, glycated hemoglobin laboratory test indicating glucose levels over a 6- to 12-week period.

! Medical consultation with physician is recommended for patients with uncontrolled diabetes.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Consultation with physician if medical information is incomplete.
- Treatment should be postponed for uncontrolled diabetes, antibiotic prophylaxis may be required for emergency treatment due to increased risk of infection.
- Postpone routine care until diabetes is under control.
- Schedule morning appointments after the patient has eaten and taken medication.
- Minimal use of epinephrine with anesthesia, epinephrine can raise blood glucose levels.
- Do not keep the patient waiting.
- Do not interfere with the patient's regular eating schedule.
- Avoid long periods of stressful procedures.
- Prepare for diabetic emergency; juice, frosting, or oral glucose should be available.
- Recognize the signs and symptoms of hypoglycemia:
 - Moist skin/cold sweat.
 - Patient appears lethargic, anxious, agitated.
 - Tremors/nervousness.
 - Hunger, nausea.
 - Confusion/personality changes.
 - Increased pulse rate.

MANAGING AN EMERGENCY

An emergency may occur when treating a patient with diabetes. The most common medical emergency that a diabetic patient may encounter is hypoglycemia. If a patient presents with hypoglycemia, the dental care provider should:

- Administer oral glucose.
- Monitor vital signs and observe patient's response.

- If the patient goes unconscious:
 - Place the patient in a supine position.
 - Activate the emergency medical system.
 - Administer oxygen.
 - Monitor vital signs.
 - Prepare to perform basic life support.

Oral Findings	Recommendations
Burning mouth symptoms	Tricyclic antidepressants, benzodiazepines, psychotropic drugs, topical capsaicin as prescribed by the dentist
Fungal infections (candidiasis)	Topical/systemic antifungal agents (i.e., Clotrimazole troches)
Increase in periodontal disease and caries	Frequent professional prophylaxis, proper oral hygiene and nutritional counseling, fluoride
Xerostomia	Saliva substitutes, xylitol/Biotene products, sipping water, prescription products such as Salagen, Sialor, sugarless lemon drop

Hepatitis

Hepatitis is inflammation of the liver caused by a viral infection.

Medical History Follow-Up Questions for a Patient With Hepatitis

- When was your last visit with your physician?
 When were you diagnosed with hepatitis?
 What type of hepatitis did/do you have?
 How did you contract hepatitis?
 What type of treatment did you receive?
 Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.
 Do you have any liver problems/damage?

Hepatitis Virus	Transmission
Hepatitis A	Fecal-oral contamination of food or water or direct contact with an infected individual
Hepatitis B	Blood and other body fluids
Hepatitis C	Blood and blood products
Hepatitis D	Blood and other body fluids, can only cause infection or exist in the presence of hepatitis B
Hepatitis E	Fecal-oral contamination of water

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- All patients with a history of viral hepatitis should be considered potentially infectious.
- Postpone routine treatment on infectious/active hepatitis patients, urgent care should be performed in a hospital setting.
- Noninfectious patients may receive routine care employing standard precautions.
- Exercise caution when prescribing drugs that are metabolized in the liver.
- Limit the amount of lidocaine when delivering local anesthesia, consider the use of articaine.
- Recognize that abnormal bleeding may occur in patients with liver disease or damage.

HIV/AIDS

The human immunodeficiency virus (HIV) is found in bodily fluids and is transmitted via blood, semen, vaginal secretions, and breast milk. HIV is the etiologic agent for the acquired immunodeficiency syndrome (AIDS).

Medical History Follow-Up Questions for a Patient With HIV/AIDS

When was your last visit with your physician?

When were you diagnosed with HIV/AIDS?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

How has your overall health been recently?

Have you recently experienced any infections?

! Medical consultation with physician is recommended before treatment to determine the patient's current CD4+ lymphocyte count and level of immunosuppression.

Category	CD4+ lymphocytes/mm ³
1	≥ 500
2	200–499
3	< 200

The lower the CD4+ count the greater the level of immunosuppression.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Document oral lesions that may be present.
- Provide oral hygiene instructions and stress the importance of optimum biofilm removal.
- Exercise caution when prescribing drugs.
- Provide nondiscriminatory treatment.

Oral Findings	Recommendations
Herpes simplex virus	Acyclovir
Fungal infections (candidiasis)	Topical/systemic antifungal agents (i.e., Clotrimazole troches)
Increase in periodontal disease and caries	Frequent professional prophylaxis, proper oral hygiene and nutritional counseling, fluoride
Hairy leukoplakia	Acyclovir or desciclovir may assist in resolution
Kaposi's sarcoma Lymphadenopathy	Accurate documentation of size and location of lesion and appropriate referral

Hypertension

Hypertension is defined by the American Heart Association as a persistent elevation of the systolic and diastolic blood pressures above 140 mm Hg and 90 mm Hg, respectively. Hypertension is diagnosed as either primary or secondary. The etiology of primary hypertension is caused by risk factors such as obesity, genetics, smoking, sedentary life style, race, gender, and poor diet. Secondary hypertension is caused by an underlying medical condition. Approximately 95% of individuals diagnosed with hypertension are primary hypertensive and 5% present with secondary hypertension.

Medical History Follow-up Questions for a Patient With Hypertension

When was your last visit with your physician?
 When were you diagnosed with hypertension?
 Do you have primary or secondary hypertension?
 When was the last time you had your blood pressure checked?
 How frequently do you monitor your blood pressure?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Do you take your medications regularly?

Are you following a specific diet and exercise regimen?

What was your most recent blood pressure reading?

How are you feeling today? Stressed? Anxious?

! Medical referral is crucial for patients with Stage II hypertension.

Adult BP Classification	Systolic	Diastolic
Normal	<120 mm Hg	<80 mm Hg
Prehypertension	120–139 mm Hg	80–89 mm Hg
Stage 1 hypertension	140–159 mm Hg	90–99 mm Hg
!Stage 2 hypertension	≥ 160 mm Hg	≥ 100 mm Hg

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Obtain blood pressure.
- Provide a stress-free environment.
- If patient is overly stressed, terminate appointment.
- Avoid orthostatic hypotension by raising chair slowly.
- Recognize signs and symptoms of high blood pressure
 - Dizziness, occipital headaches, ringing in the ears, failing vision, tingling in the hands and feet.
- Provide oral hygiene instructions and stress the importance of nutrition.

Myocardial Infarction

Myocardial infarction, commonly known as a heart attack, occurs when blood supply to the heart is blocked causing death and/or damage to the heart muscle.

Medical History Follow-Up Questions for a Patient with a History of a Myocardial Infarction

When was your last visit with your physician?

Date of your myocardial infarction(s)? Complications?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! Medical consultation with physician is recommended before treatment for patients with a history of a myocardial infarction within a 6-month time frame. (Due to highest risk for reoccurrence within this time period.)

! Medical consultation with physician is recommended for patients taking blood thinners such as Coumadin/warfarin. (INR "International Normalized Ratio" should be less than 3.0 and PT "Prothrombin Time" should fall in normal range which is 11-15 seconds.)

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Reduce anxiety during appointment.
- Morning or early afternoon appointment.
- Short appointments.
- Premedication with diazepam.
- Terminate appointment if patient becomes fatigued.
- Position patient semi-upright (comfortable).
- Limit use of epinephrine.
- Recognize the signs and symptoms of a myocardial infarction:
 - Pain that may last for extended periods (not relieved by nitroglycerin).
 - Indigestion for 12+ hours.
 - Cold perspiration.
 - Weakness.

- Shortness of breath.
- Nausea/vomiting.
- Blood pressure falls below baseline.

MANAGING AN EMERGENCY

An emergency may occur during the appointment with a patient who has a history of myocardial infarction. In the event that a patient begins to experience signs and symptoms of a heart attack, the dental care provider should:

- Activate the emergency medical system.
- Administer oxygen.
- Monitor vital signs.
- Prepare to perform basic life support.

Organ Transplantation

Transplantation involves replacing a diseased/nonfunctioning organ with a functioning organ. Heart, liver, kidney, pancreas, lung, and bone marrow are common organs used for transplantation. The immune system normally attacks foreign bodies; therefore, patients with transplanted organs are commonly on immunosuppressant drugs to prevent the rejection of the transplanted organ. Immunosuppressant drugs also hinder the body's ability to fight infection.

Medical History Follow-Up Questions for a Patient with Organ Transplantation

What type of transplant do you have?
When was your last visit to the physician?
When was the transplant performed?
Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! If it is less than 6 months since the transplant, postpone elective treatment. Medical consultation with physician is required for emergency care.

! If the implant was inserted more than 6 months ago, medical consultation is required for the following: possible antibiotic prophylaxis, possible need for steroid supplementation, to determine potential for excessive bleeding because patient may be on anticoagulant therapy.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Liver or kidney recipients should not be prescribed drugs that are toxic to the liver or kidney, such as NSAIDs.
- Oral findings associated with immunosuppressant drugs include: poor wound healing, infection, hyperplasia, and bleeding.
- Oral findings that may indicate overimmunosuppression are indicated in the following table, consult with physician if these oral findings are present.

Oral Findings (overimmunosuppression)	Recommendations
Herpes simplex	Antiviral agents, topical (Abbrevia), systemic (Valtrex); palliative treatment also includes coating the lesion with a lanolin-based lip ointment or petroleum jelly
Fungal infections (candidiasis)	Topical/systemic antifungal agents (i.e., Clotrimazole troches)
Mucositis	Salt/water rinses, combined prescription of viscous lidocaine/ Benadryl/Kaopectate, or Benadryl/ Maalox/nystatin elixir, soft diet
Large, slow-healing ulcers	Orabase

Pregnancy

Medical History Follow-Up Questions for a Pregnant Patient

Are you currently under the care of a physician?

What trimester are you in?

Are you experiencing any complications with the pregnancy?

Are you having nausea or morning sickness?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Elective treatment should be provided during the second trimester.
- Monitor blood pressure.
- Short appointments, if patient is experiencing nausea/morning sickness schedule appointments in the afternoon.
- Semi-supine chair position, pillow under right hip during the third trimester to decrease the pressure placed on the vena cava
- Avoid stimulation of gag reflex.
- Radiographs only when the benefit outweighs the risk.
- Use caution when prescribing drugs.
- Provide oral hygiene instructions/nutritional counseling and stress the importance of optimum biofilm removal.

MANAGING AN EMERGENCY

Supine hypotensive syndrome (sudden fall in blood pressure) may occur during the appointment with a pregnant patient. In the event of an emergency, the dental care provider should:

- Position the patient onto her left side, to alleviate pressure from the uterus on the vena cava.
- Administer oxygen.
- Monitor vital signs.
- Activate the emergency medical system if indicated.

Oral Findings	Recommendations
Increase in gingivitis/periodontal disease	Frequent professional prophylaxis, proper oral hygiene and nutritional counseling, fluoride
Pyogenic granuloma	Accurate documentation of size and location and provide appropriate referral
Perimylolysis/enamel erosion	Rinse with sodium bicarbonate after vomiting to neutralize the acid, sugarless gum containing xylitol, soft toothbrush, fluoride

Prosthetic Replacements: Joint, Plates, Screws, Pins

Fabricated substitute for a diseased or missing body part.

Medical History Follow-Up Questions for a Patient With a Prosthetic Replacement

What type of prosthesis do you have?

When and why was it placed?

Have you had any infections involving the prosthesis?

Did your orthopedic surgeon indicate that you need to take antibiotics before dental treatment?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! Medical consultation is recommended. According to the American Academy of Orthopaedic Surgeons (2009), antibiotic prophylaxis is recommended for all patients that have undergone total joint replacement.

! Medical consultation is recommended for high risk immunocompromised/immunosuppressed patients: rheumatic arthritis, systemic lupus erythematosus disease, drug- or radiation-induced immunosuppression.

Dental Hygiene Treatment Modifications

A combined statement from the American Dental Association and the American Academy of Orthopaedic Surgeons **states antibiotic prophylaxis is not indicated for pins, plates, or screws.**

! If patient is immunocompromised/immunosuppressed, consult patient's physician.

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

Renal Failure

The kidneys are responsible for the removal of nitrogenous wastes. Renal failure is progressive bilateral deterioration of renal function resulting in uremia and eventually death. Uremia is the toxic condition produced by the retention of urinary constituents in the blood.

Medical History Follow-Up Questions for a Patient with Renal Failure

When was your last visit with your physician?
 When were you diagnosed with renal failure?
 Are you currently receiving dialysis? If so, what type?
 When was your last dialysis treatment?
 Do you have a shunt, graft, catheter, or fistula? If so, where and when was it placed?
 Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! Medical consultation with physician is recommended for those patients receiving hemodialysis or who have undergone a kidney transplant. Patient may require antibiotic prophylaxis.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Provide dental treatment the day after hemodialysis (because of anticoagulant drugs used during hemodialysis).
- Avoid taking blood pressure in arm with arteriovenous shunt.
- Patients should avoid aspirin, NSAIDs, acetaminophen, tetracycline, acyclovir.

Oral Findings	Recommendations
Cyclosporine induced gingival enlargement	Oral hygiene instruction (OHI), frequent professional prophylaxis
Dysgeusia (bad taste)	Rinse with water, sugar-free mints
Fungal infections (candidiasis)	Topical/systemic anti-fungal agents, i.e., Clotrimazole troches
Increase in gingivitis/periodontal disease	Frequent professional prophylaxis, proper oral hygiene and nutritional counseling, fluoride

Continued

Oral Findings	Recommendations—cont'd
Petechiae/ecchymosis	Accurate documentation of size and location
Uremic odor	Alcohol-free mouthrinse
Xerostomia	Saliva substitutes, xylitol/Biotene products, sipping water, prescription products such as Salagen, Sialor, sugarless lemon drops

Seizure Disorder

A seizure disorder is a chronic brain disorder of various etiologies characterized by recurrent seizures as a result of a sudden discharge of electrical energy caused by an imbalance among the neurons of the brain. Seizures may or may not involve convulsions or spasm and a loss of consciousness. Seizures are generally involuntary, random, and uncontrollable.

Medical History Follow-Up Questions for a Patient with a Seizure Disorder

When was your last visit with your physician?
When were you diagnosed with a seizure disorder?
When was your last seizure?
How long do the seizures usually last?
How frequently do you experience seizures?
What precipitates a seizure?
Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.
Do you take your medications regularly?
Do you have a cerebral shunt?
How are you feeling today? Stressed? Anxious?

! Medical consultation is recommended for patients with poorly controlled seizures or a recent change or increase in frequency. (Seizures occurring more than once weekly.)

! Medical consultation is recommended for patients with cerebral shunts.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Provide a stress-free environment.
- Recognize signs and symptoms of a seizure.
- Recognize the possibility of memory impairment and/or drowsiness due to medications.
- Provide oral hygiene instructions and stress the importance of optimum biofilm removal.
- Recommend a frequent recall interval.
- Avoid shining the overhead light in the patient's eyes.

MANAGING AN EMERGENCY

In the event that a seizure occurs during the appointment the dental professional should:

- Place the patient in the supine position.
- Time the length of the seizure.
 - If the seizure lasts longer than 5 minutes or if multiple seizures occur, activate the emergency medical system.
- Push aside any equipment or objects to avoid injury.
- DO NOT place anything in the patient's mouth.
- Evaluate the patient's level of consciousness/confusion when the seizure is over.
- Arrange for transportation/support for patient.

Oral Findings	Recommendations
Scarring of oral tissues	Document size and location
Fractured teeth	Restore as indicated
Gingival hyperplasia	Stress the importance of biofilm removal, frequent recalls, chlorhexidine gluconate rinses, recommend patient consult with physician regarding a possible change in drug prescription, refer to periodontist if surgical intervention is required

Substance-Related Disorders

Substance dependence refers to a pattern of repeated self-administration of a drug. Psychological dependence is based on a desire to continue taking a drug to induce pleasure or relieve tension and avoid discomfort. This often results in tolerance, the need for increased amounts of the drug to achieve intoxication, withdrawal, and unpleasant physical and psychological effects. Substance abuse describes a more broadly conceived, less severe pattern of drug use. It interferes with the person's ability to fulfill major role obligations at work or at home, the recurrent use of a drug in dangerous situations, and the repeated legal difficulties associated with substance abuse.

Medical History Follow-Up Questions for a Patient with a Substance-Related Disorder

Are you currently in recovery?

How long have you been in recovery?

If no, when was the last time you used drugs or alcohol?

What types of substances were you addicted to?

Have you used cocaine or methamphetamine within the last 24 hours?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Avoid alcohol-containing mouth rinses.
- Avoid prescribing medications that have addictive potential.
- Avoid local anesthetics that contain epinephrine or levonordefrin for at least 6 and 8 hours respectively after the administration of cocaine/methamphetamine.
- Chronic methamphetamine use can result in “Meth Mouth,” a condition characterized by excessive caries and erosion.

Oral Findings	Recommendations
Xerostomia	Saliva substitutes, xylitol/Biotene products, sipping water, prescription products such as Salagen, Sialor, and sugarless lemon drops
Dysgeusia (bad taste)	Rinse with water, sugar-free gum and mints
Erosion (vomiting)	Fluoride rinses/custom trays
Increase in periodontal disease and caries	Frequent professional prophylaxis, proper oral hygiene and nutritional counseling, fluoride, referral to specialist if necessary

Tuberculosis

Tuberculosis is a serious communicable disease that is caused by the *Mycobacterium tuberculosis* organism. Tuberculosis is spread by the inhalation, inoculation, or ingestion of infected droplets.

Medical History Follow-Up Questions for a Patient with Tuberculosis

When was your last visit with your physician?

When were you diagnosed with tuberculosis?

What type of treatment did you receive?

When was your last chest x-ray?

Have you experienced any of the following: persistent cough, weight loss, fever, fatigue?

Did you complete the prescribed treatment for tuberculosis?

Are you currently taking any medication? Please provide the name/s and dosage/s of the medication/s.

! Tuberculosis treatment considerations are indicated in the following table:

Patient Reports	Follow up	Recommendations
History of tuberculosis	Obtain a thorough medical history including treatment received for active disease Confirm history of chest x-rays	Proceed with treatment
Positive tuberculin skin test	Consult with physician to determine if disease is absent or active Identify if patient was placed on isoniazid for prophylaxis purposes	If disease is absent, proceed with treatment

Continued

Patient Reports	Follow up	Recommendations
! Signs/symptoms of active tuberculosis	! Identify active signs/symptoms of disease during medical history: Fever, fatigue, weight loss, dry cough, chest pain	! Postpone treatment and refer patient to physician After 2 to 3 weeks of receiving standard antituberculosis therapy, the patient may receive treatment pending physician consultation to confirm that TB has become noninfectious
! Active sputum-positive tuberculosis	! Consult with physician before treatment	! Postpone routine treatment Provide urgent care only in a hospital setting

Commonly Prescribed Antituberculous Drugs

- Isoniazid.
- Pyrazinamide.
- Rifampin.
- Ethambutol.

Dental Hygiene Treatment Modifications

! Patient may present with oral findings due to prescribed medications. Refer to Meds tab.

- Postpone routine treatment on patients with infectious/active tuberculosis, urgent care should be performed in a hospital setting.

- Noninfectious patients may receive routine care.
- Patients taking isoniazid should avoid acetaminophen.
- Patients taking rifampin may experience delayed healing and be prone to infection.

Document findings of oral lesions.

Oral Findings	Recommendations
Ulcers	Palliative treatment
Gingival bleeding	Proper oral hygiene
Enlarged lymph nodes	Continuation of antituberculous medication, refer to physician

Emergency Drugs

Drug	Use
Epinephrine	Anaphylaxis
Oxygen	Hypoxia
Albuterol	Bronchospasm
Nitroglycerin	Angina Pectoris
Diazepam	Seizure
Aspirin	Myocardial Infarction
Glucagon	Hypoglycemia
Ammonia	Syncope

Classification of Drugs and Their Endings

Classification	Common Ending	Example
ACE inhibitors	-pril	enalapril
Antianxiety	-lam, -pam	diazepam
Antihyperlipidemic	-statin	lovastatin
Antiviral	-vir	acyclovir
Beta blockers	-olol	propranolol
Diuretics	-mide, -zide	hydrochlorothiazide
Local anesthetics	-caine	mepivacaine
Opioid	-done	hydrocodone

Commonly Prescribed Drugs by Classification

Type of Drug	Trade Name	Generic Name	Dental Concerns
ACE Inhibitors			
	Accupril	quinapril	Postural hypotension
	Altace	ramipril	Xerostomia
	Capoten	captopril	Xerostomia, taste alteration
	Lotensin	benazepril	
	Monopril	fosinopril	Xerostomia, postural hypotension, taste alteration
	Prinivil	lisinopril	Xerostomia, taste alteration
	Vasotec	enalapril maleate	Stomatitis, glossitis, taste alteration
Alpha/Beta Blockers			
	Coreg	carvedilol	Xerostomia, postural hypotension
Alzheimer's			
	Aricept	donepezil	Postural hypotension
	Cognex	tacrine	

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Analgesics			
Nonopioids	Advil, Motrin, Nuprin	ibuprofen	Increased bleeding
	Celebrex	celecoxib	Xerostomia
	Clinoril	sulindac	Xerostomia
	Dolobid	diflunisal	
	Indocin	indomethacin	
	Naprosyn, Anaprox	naproxen	
	Orudis	ketoprofen	
	Voltaren	diclofenac	Xerostomia
Opioids	Combunox	oxycodone/ ibuprofen	
	Darvocet	propoxyphene/ acetaminophen	
	Darvon	propoxyphene	
	Demerol	meperidine	Postural hypotension
	Dilaudid	hydromorphone	Xerostomia
	Duragesic	fentanyl transdermal	Postural hypotension, xerostomia
	Endocet, Percocet	oxycodone/ acetaminophen	Xerostomia

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Lorcet, Vicodin	hydrocodone acetaminophen	
	Vicoprofen	hydrocodone/ibuprofen	
	OxyContin, Roxicodone	oxycodone	Postural hypotension, xerostomia
	Talwin	pentazocine	Xerostomia
	Tylenol #2, #3, #4	codeine/acetaminophen	Xerostomia
	Ultram	tramadol	Postural hypotension, xerostomia
Angiotensin II Inhibitors			
	Atacand	candesartan cilexetil	
	Avapro	irbesartan	
	Benicar	olmesartan medoxomil	
	Cozaar	losartan	Xerostomia
	Diovan HCT	valsartan/hydrochlorothiazide	Xerostomia
	Hyzaar	losartan/hydrochlorothiazide	Xerostomia, Sialoadenitis

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Antacids/GERD			
	AcipHex	rabeprazole	Xerostomia, stomatitis, glossitis, gingivitis
	Axid	nizatidine	
	Nexium	esomeprazole	Ulcerative stomatitis
	Pepcid	famotidine	Xerostomia, taste disorder
	Prevacid	lansoprazole	
	Prilosec	omeprazole	
	Protonix	pantoprazole	Increased salivation
	Tagamet	cimetidine	
	Zantac	ranitidine	
Antianginal Agents			
	Isordil	isosorbide dinitrate	Postural hypotension
	Transderm-Nitro	nitroglycerin	Postural hypotension
Antianxiety Agents			
	Ativan	lorazepam	Xerostomia, extra pyramidal behavior

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	BuSpar	bupirone	Xerostomia, extra pyramidal behavior
	Halcion	triazolam	Xerostomia, taste disorder, stomatitis
	Librium	chlordiazepoxide	Xerostomia, coated tongue
	Restoril	temazepam	Xerostomia, taste disorder
	Serax	oxazepam	Xerostomia, coated tongue, gingival pain
	Tranxene	clorazepate	Xerostomia, coated tongue
	Valium	diazepam	Xerostomia, coated tongue
	Versed	midazolam	Excessive salivation, taste disorder
	Xanax	alprazolam	Xerostomia
Antiarrhythmics			
	Betapace	sotalol hydrochloride	Xerostomia

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Anticoagulant			
	Coumadin	warfarin	Increased bleeding, ! Consult MD before treatment
Heparin	Lovenox	enoxaparin sodium	! Consult MD before treatment
Platelet Inhibitors	Aggrenox	dipyridamole/ ASA	Taste loss, ! Consult MD if significant bleeding is anticipated
	Aspirin		Increased bleeding
	Persantine	dipyridamole	! Consult MD if significant bleeding is anticipated
	Plavix	clopidogrel	Taste disorder, ! Consult MD if significant bleeding is anticipated
	Ticlid	ticlopidine	! Consult MD if significant bleeding is anticipated
Anticonvulsants			
	Depakote	valproic acid	Xerostomia, glossitis
	Dilantin	phenytoin sodium	Gingival hyperplasia
	Klonopin	clonazepam	Xerostomia, coated tongue

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Lamictal	lamotrigine	Xerostomia
	Luminal	phenobarbital	
	Neurontin	gabapentin	Xerostomia
	Tegretol	carbamazepine	Xerostomia, glossitis, stomatitis
	Topamax	topiramate	Xerostomia
	Trileptal	oxcarbazepine	Xerostomia
Antidepressants			
	Desyrel	trazodone HCL	Xerostomia, postural hypotension
	Effexor	venlafaxine HCL	Xerostomia
	Nardil	phenelzine sulfate	Xerostomia, postural hypotension
	Serzone	nefazodone HCL	Xerostomia, postural hypotension, photophobia
	Wellbutrin	bupropion HCL	Xerostomia
SSRIs (selective serotonin reuptake inhibitors)	Celexa	citalopram	Xerostomia, postural hypotension
	Lexapro	escitalopram oxalate	Xerostomia

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Luvox	fluvoxamine maleate	Xerostomia, postural hypotension
	Paxil	paroxetine	Xerostomia
	Prozac	fluoxetine	Xerostomia, postural hypotension, photophobia
	Zoloft	sertraline	Xerostomia
Tricyclics	Elavil	amitriptyline HCL	! Do not use levonordefrin with epinephrine Xerostomia, extra pyramidal behavior, postural hypotension
	Pamelor	nortriptyline HCL	! Do not use levonordefrin with epinephrine Xerostomia, extra pyramidal behavior, postural hypotension
	Tofranil	imipramine HCL	! Do not use levonordefrin with epinephrine Xerostomia, extra pyramidal behavior, postural hypotension

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Antidiabetics			
	Actos	pioglitazone	
	Amaryl	glimepiride	
	Avandamet	metformin/ rosiglitazone	
	Avandia	rosiglitazone	
	DiaBeta	glyburide	
	Diabinese	chlorpropamide	Taste alteration
	Dymelor	acetohexamide	
	Glucophage	metformin	Taste alteration
	Glucotrol	glipizide	
	Glyset	miglitol	
	Metaglip	metformin/ glipizide	
	Precose	acarbose	
	Starlix	nateglinide	
Antihistamines			
	Allegra	fexofenadine HCL	Xerostomia
	Atarax	hydroxyzine	Xerostomia
	Benadryl	diphenhydramine	Postural hypotension, stomatitis
	Bonine	meclizine	Xerostomia
	Clarinet	desloratadine	Xerostomia

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Claritin	loratadine	Xerostomia, postural hypotension
	Patanol	olopatadine HCL	Taste alteration
	Zyrtec	cetirizine HCL	Xerostomia, photophobia
Anti-infectives			
Antifungals	Diflucan	fluconazole	Taste alteration
	Lamisil	terbinafine HCL	Taste alteration
	Mycelex	clotrimazole	
	Mycostatin	nystatin	
	Nizoral	ketoconazole	
Antivirals (herpes simplex)	Abreva	docosanol	Tingling upon application
	Denavir	penciclovir	Taste alteration
	Valtrex	valacyclovir	
	Zovirax	acyclovir	Burning, stinging
Herpes zoster	Famvir	famciclovir	
	Valtrex	valacyclovir	
HIV disease	Agenerase	amprenavir	Candidiasis
	AZT	zidovudine	Gingival bleeding, ulceration, dysphagia

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Combivir	Lamivudine/ zidovudine	
	Epivir	lamivudine	
	Norvir	ritonavir	Candidiasis
	Trizivir	abacavir/ lamivudine, zidovudine	Stomatitis, oral pigmentation, candidiasis
	Viracept	nelfinavir	Ulceration
Antibiotics			
Cephalo- sporins	Ceclor	cefadroxil	Tongue discoloration, taste alteration, candidiasis, decreased contraceptive action
	Keflex	cephalexin	Tongue discoloration, taste alteration, candidiasis, decreased contraceptive action
	Lorabid	loracarbef	Candidiasis, decreased contraceptive action

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Fluoro-quinolones	Cipro	ciprofloxacin	
	Levaquin	levofloxacin	
Macrolides	Biaxin	clarithromycin	Candidiasis, taste alteration, decreased contraceptive action
	Zithromax	azithromycin	Tongue discoloration, candidiasis, decreased contraceptive action
Penicillins	Amoxil	amoxicillin	Glossitis, tongue discoloration, taste alteration, decreased contraceptive action
	Augmentin	amoxicillin/clavulanate	Candidiasis, decreased contraceptive action
	Penicillin VK	penicillin	Glossitis, black hairy tongue, candidiasis, decreased contraceptive action

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Tetracyclines	Arestin	minocycline	Stomatitis, candidiasis
	Atridox	doxycycline hyclate	Glossitis, black hairy tongue, candidiasis, decreased contraceptive action
	Minocin	minocycline	Stomatitis, candidiasis, do not use sodium bicarbonate (prophy jet) at the same time dose is taken
	Periostat	doxycycline hyclate	Glossitis, black hairy tongue, candidiasis
Anti-inflammatory Agents			
	Benemid	probenecid	
	Celebrex	celecoxib	Stomatitis, taste alteration
	Clinoril	sulindac	
	Daypro	oxaprozin	Stomatitis
	Dolobid	diflunisal	
	Enbrel	etanercept	Taste alteration, ulcerations

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Indocin	indomethacin	
	Lodine	etodolac	Xerostomia, stomatitis, taste alteration
	Motrin	ibuprofen	
	Orudis	ketoprofen	
	Remicade	infliximab	
	Rheumatrex	methotrexate	Stomatitis
	Zyloprim	allopurinol	Taste loss, stomatitis
Asthma/COPD			
	Accolate	zafirlukast	
	Advair Diskus	salmeterol/ fluticasone	Candidiasis
	Alupent	metaproterenol	Xerostomia, taste alteration
	Atrovent	ipratropium bromide	Xerostomia
	Combivent	albuterol/ ipratropium	Xerostomia, taste alteration, discolored teeth
	Intal	cromolyn sodium	Xerostomia, taste alteration
	Maxair	pirbuterol	Xerostomia, taste alteration

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Proventil	albuterol	Xerostomia, taste alteration, discolored teeth
	Serevent	salmeterol	Candidiasis
	Singulair	montelukast	
	Zyflo	zileuton	
Attention Deficit Disorder			
	Adderall	Amphetamine/ dextro- amphetamine	Xerostomia
	Concerta, Ritalin	methylphenidate hydrochloride	Xerostomia
Beta Blockers			
	Corgard	nadolol	Xerostomia, postural hypotension, taste alteration
	Inderal	propranolol HCL	Xerostomia
	Levatol	penbutolol	Xerostomia, taste alteration, taste loss
	Lopressor	metoprolol	Xerostomia, taste alteration
	Tenormin	atenolol	Xerostomia, taste alteration, taste loss

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Visken	pindolol	Xerostomia, taste alteration, taste loss
	Zebeta	bisoprolol fumarate	Xerostomia, taste alteration, stomatitis
Calcium Channel Blockers			
	Calan	verapamil	Xerostomia, gingival hyperplasia
	Cardene	nicardipine	Xerostomia, gingival hyperplasia
	Cardizem	diltiazem	Xerostomia, postural hypotension
	Cardura	doxazosin mesylate	Xerostomia, postural hypotension
	Catapres	clonidine	Xerostomia, postural hypotension, taste alteration
	DynaCirc	isradipine	Gingival hyperplasia

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
	Lotrel	amlodipine/ benazepril	Xerostomia, postural hypotension, gingival hyperplasia
	Norvasc	amlodipine	Xerostomia, gingival hyperplasia
	Procardia	nifedipine	Gingival hyperplasia
Cholesterol Lowering Agents			
	Advicor	niacin/lovastatin	Xerostomia, postural hypotension
	Crestor	rosuvastatin	
	Lipitor	atorvastatin calcium	
	Mevacor	lovastatin	Xerostomia, postural hypotension
	Niaspin	niacin	
	Pravachol	pravastatin	Postural hypotension
	Zetia	ezetimibe	
	Zocor	simvastatin	Taste alteration

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Diuretics			
	Aldactone	spironolactone	Xerostomia
	Aldomet	methyldopa	Xerostomia, discolored tongue
	Diovan HCT	valsartan/ hydro- chlorothiazide	Xerostomia
	Diuril	chlorothiazide	Sialoadenitis
	Hydro-Diuril	hydrochloro- thiazide	Sialoadenitis
	Hygroton	chlorthalidone	
	Hyzaar	losartan/ hydrochloro- thiazide	Xerostomia, sialoadenitis
	Lasix	furosemide	Xerostomia, postural hypotension
	Lozol	indapamide	Xerostomia, postural hypotension
	Minipress	prazosin HCL	Xerostomia, postural hypotension
Erectile Dysfunction			
	Cialis	tadalafil	Xerostomia
	Levitra	varденаfil	
	Viagra	sildenafil	

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Fibromyalgia			
	Cymbalta	duloxetine hydrochloride	Xerostomia
	Lyrica	pregabalin	Xerostomia
	Savella	milnacipran hydrochloride	Xerostomia
Glaucoma			
	Betoptic	betaxolol	
	Ocupress	carteolol	Xerostomia, taste alteration, postural hypotension
	Timoptic	timolol maleate	Xerostomia, taste alteration
Glucocorticoids (steroids)			
	Celestone	betamethasone	
	Cortef	hydrocortisone	Oral candidiasis
	Delta-Cortef	prednisolone	Poor wound healing, oral candidiasis
	Deltasone	prednisone	Poor wound healing, oral candidiasis
	Medrol	Methyl-prednisolone	Poor wound healing, oral candidiasis

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Incontinence			
	Detrol	tolterodine	Xerostomia
	Ditropan XL	oxybutynin	Xerostomia
Mental Illness			
	Abilify	aripiprazole	Extrapyramidal effects
	Clozaril	clozapine	Xerostomia
	Haldol	haloperidol	Xerostomia, tardive dyskinesia
	Mellaril	thioridazine	Xerostomia, tardive dyskinesia
	Risperdal	risperidone	Xerostomia
	Seroquel	quetiapine	Xerostomia, tardive dyskinesia
	Zyprexa	olanzapine	Xerostomia, tardive dyskinesia, postural hypotension
Migraines			
	Imitrex	sumatriptan	Xerostomia, mouth or tongue discomfort
	Zomig	zolmitriptan	Taste alteration

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Oral Contraceptives			
	Apri	ethinyl estradiol	
	Aviane	levonorgestrel/ ethinyl estradiol	Monitor gingival changes
	Mircette	ethinyl estrodiol/ and desogestrel	Monitor gingival changes
	Necon	ethinyl estradiol/ norethindrone	Monitor gingival changes
	Ortho-novum	norethindrone/ ethinyl estradiol	Monitor gingival changes
	Trivora-28	levonorgestrel/ ethinyl estradiol	Monitor gingival changes
Osteoporosis			
	Actonel	risedronate sodium	
	Boniva	ibandronate	Osteonecrosis (rare)
	Evista	raloxifene	
	Fosamax	alendronate sodium	Osteonecrosis (rare)
	Zometa	zoledronic acid	Sore throat, stomatitis, mucositis

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Parkinson's			
	Akineton	biperiden	Extrapyramidal effects, postural hypotension, photophobia, xerostomia
	Cogentin	benztropine	Postural hypotension, photophobia, xerostomia, do not use sodium bicarbonate (prophy jet) within 1 hour of taking benztropine
	Dostinex	cabergoline	Postural hypotension, xerostomia
	Mirapex	pramipexole dihydrochloride	Extrapyramidal effects, xerostomia
	Requip	ropinirole	Extrapyramidal effects, postural hypotension, xerostomia
	Sinemet	levodopa/carbidopa	Extrapyramidal effects, postural hypotension, xerostomia

Continued

Commonly Prescribed Drugs by Classification—cont'd

Type of Drug	Trade Name	Generic Name	Dental Concerns
Sedative/Hypnotic			
	Ambien	zolpidem tartrate	Xerostomia
	Lunesta	eszopiclone	Xerostomia, taste alteration
Thyroid Disease			
	Armour thyroid	thyroid	
	Synthroid	levothyroxine	
Tuberculosis			
	INH	isoniazid	
	Myambutol	ethambutol	
		pyrazinamide (generic only)	
	Rifadin	rifampin	Sore mouth and tongue

Managing Dentin Hypersensitivity

Dentin hypersensitivity is transient pain usually the result of a mechanical or thermal stimulus to the exposed root surface. Various topical methods can be used to reduce dentin hypersensitivity.

Potassium Salts

- Products containing potassium chloride, potassium nitrate, potassium citrate, or potassium oxalate reduce depolarization of the nerve cell membrane and transmission of the nerve impulse.
- Potassium nitrate dentifrices containing fluoride are widely used and readily available over the counter and include **Sensodyne, Crest Sensitivity, Sensodyne, ProNamel**.

Fluorides

- Fluorides precipitate calcium fluoride crystals within the tubule to decrease the lumen diameter.
- Fluorides create a barrier by precipitating CaF_2 at the exposed dentin surface to block tubule openings; products include **Duraphat, Gel-Kam, DentinBloc, PreviDent**.
- Tray-delivered sodium or stannous fluoride applied using custom tray delivery.
- A 5% sodium fluoride varnish reduces hypersensitivity when applied to the exposed dentin surface.
- Prescription fluoride gels that are self-applied assist in the management of generalized hypersensitivity.

Oxalates

- Oxalate salts such as potassium oxalate and ferric oxalate precipitate calcium oxalate crystals to decrease the lumen diameter; products include **D/Sense Crystal**.

Glutaraldehyde

- Coagulates proteins and amino acids within the dental tubule to decrease the lumen diameter.
- Can be combined with HEMA, a hydrophilic resin that seals tubules; products include **Glu/Sense**.

Dibasic Calcium Phosphate/Calcium Hydroxide

- Creates calcium crystals within the dental tubule to decrease the lumen diameter.

Calcium Phosphates

- Used for caries control to reduce demineralization and to remineralize tooth structure by releasing calcium and phosphate ions for deposition of new tooth mineral (hydroxypapatite); clinical evidence is still needed to support efficacy for treatment of hypersensitivity; products include **MI Paste**.

Topical Anesthesia

Topical anesthesia is used for short duration pain management of the gingiva. This product is applied to the surface of the mucous membrane and results in anesthesia of terminal nerve endings. The clinician may consider the use of topical anesthesia for the following:

- To minimize patient discomfort during instrumentation.
- Before administration of local anesthesia.
- To minimize a patient's gag reflex.
- Before removing sutures.

Common Topical Anesthetics

Brand Name	How Supplied	Concentration	Onset	Duration
Benzocaine	Gel Liquid	20% 20%	1–2 min 30 sec	5–15 min 10–20 min
Cetacaine	Spray	2% tetracaine 14% benzocaine	30 sec	30–60 min
Lidocaine	Ointment	5%	1–2 min	5–15 min
Oraqix	Liquid that turns to gel at body temperature	2.5% lidocaine 2.5% prilocaine	30 sec	20–30 min
DentiPatch	Transmucosal patch	46.1 mg lidocaine	15 min	35–45 min

Local Anesthetic Agents

Always review patient's medical history and follow manufacturer's guidelines regarding Maximum Recommended Dosages and contraindications of local anesthesia.

Agents With Vasoconstrictors

Generic	2% Lidocaine w/epinephrine
Trade name	Xylocaine w/epinephrine, Octocaine
Vasoconstrictor concentration	1:100,000

Continued

Agents With Vasoconstrictors—cont'd

Duration	Intermediate
Pulpal anesthesia	60 min
Soft tissue anesthesia	3–5 hours
Generic	2% Mepivacaine w/Levonordefrin
Trade name	Carbocaine, Polocaine
Vasoconstrictor concentration	1:20,000
Duration	Intermediate
Pulpal anesthesia	60 min
Soft tissue anesthesia	3–5 hours
Generic	Prilocaine
Trade name	Citanest Forte
Vasoconstrictor concentration	1:200,000
Duration	Intermediate
Pulpal anesthesia	60–90 min
Soft tissue anesthesia	3–8 hours
Generic	4% Articaine HCL
Trade name	Septocaine
Vasoconstrictor concentration	1:100,000 1:200,000
Duration	Intermediate
Pulpal anesthesia	45–75 min
Soft tissue anesthesia	3–6 hours

Continued

Agents With Vasoconstrictors—cont'd

Generic	Bupivacaine
Trade name	Marcaine
Vasoconstrictor concentration	1:200,000
Duration	Long
Pulpal anesthesia	1.5–3 hours
Soft tissue anesthesia	4–9 hours

Agents Without Vasoconstrictors

Generic	2% Lidocaine HCL
Trade name	Xylocaine
Duration	Short
Pulpal anesthesia	5–10 min
Soft tissue anesthesia	60–120 min
Generic	3% Mepivacaine Plain
Trade name	Carbocaine, Polocaine
Duration	Short
Pulpal anesthesia	20–40 min 20 min via infiltration 40 min block
Soft tissue anesthesia	2–3 hours

Elevated Levels of Local Anesthesia

	Signs	Symptoms	Treatment
Moderate blood levels	Central nervous system effects: Excitation, apprehension, talkativeness, confusion, nervousness, slurred speech Cardiovascular effects: Elevated blood pressure, heart rate, and respiratory rate	Lightheadedness, restlessness, dizziness, headache, blurred vision, disorientation	Monitor vitals, administer oxygen, as time passes the drug will begin to metabolize
High blood levels	Central nervous system effects: Tonic-clonic seizures, central nervous system depression Cardiovascular effects: Reduced blood pressure, heart rate, and respiratory rate	Loss of consciousness	Summon emergency medical assistance, basic life support

Elevated Levels of Vasoconstrictor (Heart Related)

Signs	Symptoms	Treatment
Elevated systolic pressure, increased heart rate	Tension, restlessness, perspiration, palpitations, respiratory difficulty	Monitor vitals, administer oxygen

Administration of Local Anesthesia

Local anesthesia is used for the management of dental pain. It blocks sensations of pain by depolarizing the nerve cell.

Armamentarium

The collection of supplies necessary to provide local anesthesia include the following:

- Syringe.
- Needle.
- Cartridge.
- Topical anesthetic.
- Cotton swabs.
- Cotton gauze (2 x 2).
- Hemostat.
- Sharps disposal system.

Syringe: An American Dental Association (ADA) approved syringe is recommended. For a syringe to meet the ADA guidelines, it must: be able to withstand repeated sterilization, permit repeated use of a wide variety of cartridges and needles, be lightweight and capable of providing effective aspirations.

Needle: Needles should be stainless steel, presterilized, and disposable. The gauge may be 25- or 27-gauge. Long needles are approximately 32 mm in length whereas short needles are approximately 20 mm.

Cartridge/Carpule: The anesthetic cartridge is prefilled with 1.8 mL of anesthetic and should be stored at room temperature away from the light.

Preinjection Procedure

! Consult medical history.

- Wipe the injection site with a 2 x 2 gauze.
- Apply a small amount of topical anesthetic to the area to be injected.
- Allow topical anesthetic to remain on for 1–2 minutes.
- Wipe off excess topical anesthetic.

Anesthetic Injection Techniques

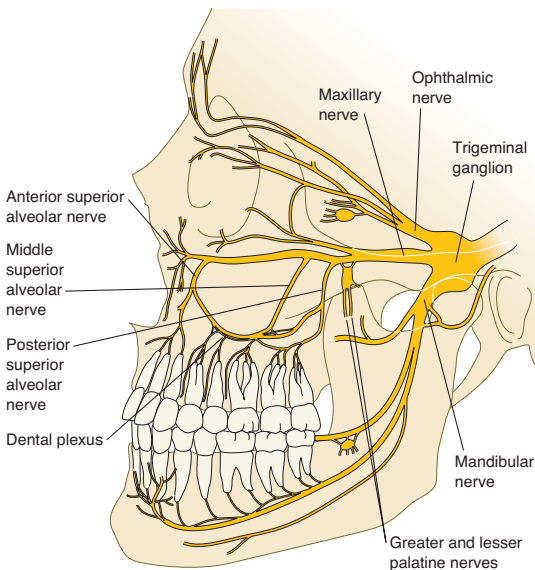
There are two major types of anesthetic injection techniques: supraperiosteal/local infiltration and the nerve block.

The **supraperiosteal/local infiltration** technique places anesthetic solution near small terminal nerve endings.

The **nerve block** technique places the anesthetic solution close to a main nerve trunk.

Local anesthetics are injected in either the maxillary region or the mandibular region.

Maxillary Injections



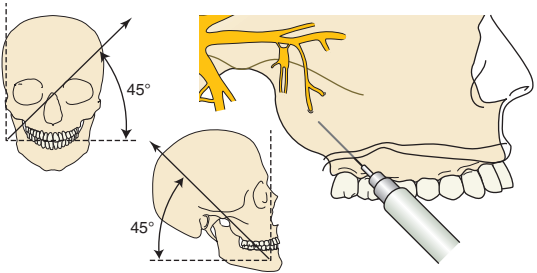
Posterior Superior Alveolar (PSA) Nerve Block

Anesthetizes the maxillary third, second, and first molars. (Excluding the mesial buccal root of the first molar.)

Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.

- Apply topical anesthetic to prepare tissue for injection.
- Adjust the bevel of needle so that it is directed toward bone.
- The patient's mouth should be open slightly, pulled toward injection side.
- Retract and pull tissue taut.
- Insert needle into the height of the mucobuccal fold (over the second molar).
- Hold the syringe parallel with the long axis of the tooth.
- Advance needle upward at a 45° angle, inward at a 45° angle, and backward at a 45° angle until the needle has been advanced approximately 16 mm.



Aspirate (aspirate, rotate syringe one quarter turn, and aspirate again).

- If both aspirations are negative, **deposit approximately 0.9 mL–1.8 mL** of anesthetic slowly over 30–60 seconds.
- Aspirate several times during the procedure.
- Remove the syringe gradually.
- Safely recap the needle.
- Allow 3–5 minutes to pass before beginning planned treatment.

! Overinsertion of the needle increases the risk of a hematoma.

PSA Nerve Block

Injection Site	Height of the mucobuccal fold over the second molar
Nerves anesthetized	Posterior superior alveolar
Gauge	25- or 27-gauge
Needle Length	Short needle (20 mm)
Depth	16 mm
Volume	0.9–1.8 mL ($\frac{1}{2}$ to a full cartridge)



PSA nerve block.

Supraperiosteal/Infiltration for PSA, MSA, ASA

Anesthetizes large terminal branches in the target areas of the posterior superior alveolar (PSA), middle superior alveolar (MSA), and anterior superior alveolar (ASA) nerves.

Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.
- Apply topical anesthetic to prepare tissue for injection.
- Adjust the bevel of the needle so that it is directed toward bone.
- The patient's mouth should be open slightly, pulled toward injection side.
- Retract and pull tissue taut.
- Insert needle into the height of the mucobuccal fold over the target area.
- Hold the syringe parallel with the long axis of the tooth.
- Advance the needle until the bevel is at or above the apical region of the target tooth.

Aspirate (2 times)

- If both aspirations are negative, **deposit approximately 0.6 mL** of anesthetic slowly over 30 seconds. (Do not allow the tissue to balloon.)
- Remove the syringe gradually.
- Safely recap the needle.
- Allow 3–5 minutes to pass before beginning planned treatment.

PSA Nerve Supraperiosteal/Infiltration

Injection site	Height of the mucobuccal fold over the distal buccal root of the second molar
Nerves anesthetized	Posterior superior alveolar
Gauge	25- or 27-gauge
Needle length	Short needle (20 mm)
Depth	<5 mm
Volume	0.6 mL ($\frac{1}{3}$ of a cartridge)



PSA nerve supraperiosteal/infiltration.

Middle Superior Alveolar (MSA) Nerve Supraperiosteal/Infiltration

Injection site	Height of the mucobuccal fold over the second premolar
Nerves anesthetized	Middle superior alveolar
Gauge	25- or 27-gauge
Needle length	Short needle (20 mm)
Depth	<5 mm
Volume	0.6 mL ($\frac{1}{3}$ of a cartridge)



MSA nerve suprapariosteal.

Anterior Superior Alveolar (ASA) Nerve Suprapariosteal/Infiltration

Injection site	Height of the mucobuccal fold over the canine
Nerves anesthetized	Anterior superior alveolar
Gauge	25- or 27-gauge
Needle length	Short needle (20 mm)
Depth	<5 mm
Volume	0.6 mL ($\frac{1}{3}$ of a cartridge)



ASA nerve suprapariosteal/infiltration.

Infraorbital Nerve Block (IO)

The IO anesthetizes the maxillary premolars, canines, and incisors.

Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.
- Apply topical anesthetic to prepare tissue for injection.
- Locate the infraorbital foramen.
- Palpate the infraorbital foramen and hold your finger over it.
- Adjust the bevel of the needle so that it is directed toward bone.
- Retract the tissue.
- Insert needle into the height of the mucobuccal fold over the first premolar.
- Hold the syringe parallel with the long axis of the tooth.
- Advance the needle until the bevel gently contacts bone.

Aspirate

- If aspiration is negative, **deposit approximately 0.9 mL–1.2 mL** of anesthetic slowly over 30–40 seconds.

- Maintain pressure with your finger over the infraorbital foramen throughout the injection, continue the pressure for 1 minute after the injection.
- Remove the syringe gradually.
- Safely recap the needle.
- Allow 3–5 minutes to pass before beginning planned treatment.

Infraorbital Nerve Block (IO)

Injection site	Height of the mucobuccal fold over the first premolar
Nerves anesthetized	Anterior and middle superior alveolar
Gauge	25-gauge
Needle length	Long needle (32 mm)
Depth	16 mm (until bone is contacted)
Volume	0.9–1.2 mL ($\frac{1}{3}$ – $\frac{1}{2}$ of a cartridge)



IO nerve block.

Greater Palatine Block

A greater palatine block anesthetizes the posterior portion of the hard palate to the first premolar.

Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.
- Injection site is about 2 mm anterior to the greater palatine foramen.
- Palpate posteriorly from the maxillary first molar, with a cotton swab along the alveolar process and palatine bone.
- The swab will “fall” into the depression created by the greater palatine foramen, which is usually distal to the maxillary second molar.
- Apply topical anesthetic to prepare tissue for injection.
- The patient’s mouth should be open wide, have patient extend the neck and turn to the right or left for increased visibility.
- Path of insertion: advance the syringe from the opposite side of the mouth at a right angle to the palate.
- Apply pressure at the area of the foramen with a cotton swab in the nondominant hand.
- Note ischemia (blanching) of tissue at the injection site.
- Apply pressure for at least 30 seconds.
- Direct the needle in from the opposite side of the mouth.
- Place the bevel gently against the ischemic tissue.
- Apply enough pressure to bow the needle slightly.
- Deposit a small amount of anesthesia.
- Straighten the needle and penetrate the mucosa.
- Continue to deposit small amounts of anesthesia throughout the procedure.
- Insert needle until bone is contacted.

Aspirate

- If aspiration is negative, **deposit approximately 0.45–0.6 mL** of anesthetic slowly over at least 30 seconds.
- Remove the syringe gradually.
- Safely recap the needle.
- Allow 2–3 minutes to pass before beginning planned treatment.

Greater Palatine Block (GP)

Injection site	Soft tissue just anterior to the greater palatine foramen
Nerves anesthetized	Greater palatine
Gauge	25- or 27-gauge
Needle length	Short needle (20 mm)
Depth	Until bone is contacted
Volume	0.45–0.6 mL ($\frac{1}{4}$ to $\frac{1}{3}$ of a cartridge)



GP block.

Nasopalatine Nerve Block

A nasopalatine nerve block anesthetizes the anterior portion of the hard palate from the right canine to the mesial of left canine.

Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.
- Apply topical anesthetic to prepare tissue for injection.

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- The patient's mouth should be open wide, have patient extend the neck and turn to the right or left for increased visibility.
- Apply pressure to side of incisive papilla with a cotton swab with nondominant hand.
- Incisive papilla should be ischemic (blanched).
- Place bevel against ischemic tissue.

! Do not insert the needle directly into the incisive papilla.

- Apply enough pressure to bow needle.
- Deposit a small amount of anesthetic.
- Straighten needle and penetrate tissue.
- Deposit small amounts of anesthesia while advancing needle.
- Depth of penetration is approximately 5 mm.

Aspirate

- If aspiration is negative, **deposit approximately 0.45 mL** of anesthetic slowly over 15–30 seconds.
- Remove the syringe gradually
- Safely recap the needle.
- Allow 2–3 minutes to pass before beginning planned treatment.

Nasopalatine Nerve Block (NP)

Injection site	Incisive foramen, beneath the incisive papilla
Nerves anesthetized	Nasopalatine
Gauge	25- or 27-gauge
Needle length	Short needle (20 mm)
Depth	Approximately 5 mm
Volume	0.45 mL (1/4 of a cartridge)

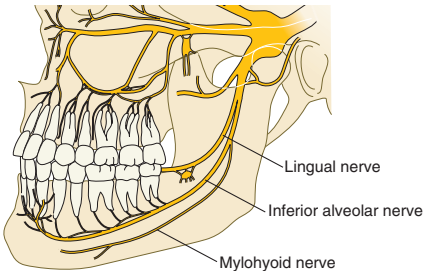


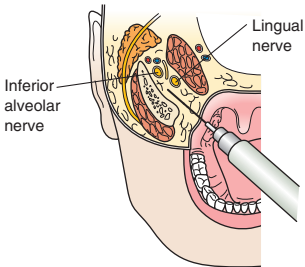
NP block.

Mandibular Injections

Inferior Alveolar Nerve Block/IANB

The IANB anesthetizes mandibular teeth to the midline and buccal soft tissue anterior to the mandibular first molar. The lingual nerve is commonly anesthetized at this time, anesthetizing the lingual soft tissue, floor of the mouth, and anterior two thirds of the tongue.





Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.
- Apply topical anesthetic to prepare tissue for injection.
- Patient's mouth should be open wide, have patient extend the neck and turn to the right or left for increased visibility.
- Palpate the coronoid notch, stretch tissue laterally.
- Imagine a line running posterior from your finger (or thumb) to the deepest part of the pterygomandibular raphe.
- This line should be parallel to the occlusal plane of the mandibular teeth.
- Insert the needle at the buccal mucosa on the medial side of the ramus, 6–10 mm above the mandibular occlusal plane, almost at the deepest recess of the pterygomandibular raphe (the needle approaches from the opposite labial commissure).
- The long needle is inserted into the pterygomandibular space until it contacts bone.
- Average depth of insertion is 20–25 mm (approximately $\frac{3}{4}$ of the length of a long needle).
- When bone is contacted, withdraw about 1 mm.

Aspirate

- If aspiration is negative, **deposit approximately 1.5 mL** of anesthetic slowly over 60 seconds.
- Slowly withdraw needle.
- Safely recap the needle.
- Sit patient upright.
- Allow 3–5 minutes to pass before beginning planned treatment.

! If bone is contacted prematurely, the needle is positioned too far anterior. If bone is not contacted, the needle is positioned too far posterior.

Inferior Alveolar Nerve Block (IANB)

Injection site	Superior to the mandibular foramen
Nerves anesthetized	Inferior alveolar, incisive, mental, lingual
Gauge	25-gauge
Needle length	Long needle (32 mm)
Depth	Approximately 20–25 mm
Volume	1.5 mL (almost a full cartridge)



Buccal Nerve Block

Anesthetizes buccal soft tissue of mandibular molars.

Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.
- Apply topical anesthetic to prepare tissue for injection.
- Patient's mouth should be open wide, have patient extend the neck and turn to the right or left for increased visibility.
- Orient bevel of needle toward the bone.
- Pull the buccal soft tissue laterally.
- Syringe is parallel to occlusal surface.
- Insert needle distal and buccal to the terminal molar, on the anterior border of the ramus.
- Needle penetrates tissue until it contacts bone (usually 1–2 mm).

Aspirate

- If negative aspiration, **deposit approximately 0.3 mL** of anesthetic slowly over 10 seconds.
- Remove the syringe gradually.
- Safely recap the needle.
- Allow 1 minute to pass before beginning planned treatment.

Buccal Nerve Block	
Injection site	Soft tissue buccal to the mandibular second molars
Nerves anesthetized	Buccal nerve
Gauge	25- or 27-gauge
Needle length	Long or short needle
Depth	1–2 mm
Volume	0.3 mL (1/3 of a cartridge)



Buccal block.

Mental/incisive Nerve Block

The mental nerve innervates the buccal mucosa anterior to the mental foramen to the midline. It also innervates the lower lip and chin to the midline. The incisive nerve innervates the pulpal tissue of the premolars, canines, and incisors.

The lingual soft tissue is not anesthetized with this injection.

Procedure

- Obtain a comprehensive medical history, determine pain management needs, and select appropriate anesthetic.
- Apply topical anesthetic to prepare tissue for injection.
- Have the patient close her or his mouth slightly to increase access, locate the mental foramen (use radiographs to assist with location if available).
- Adjust the bevel of the needle so it is directed toward bone.
- Retract and pull tissue taut.
- Insert needle into the mucous membrane, at the canine or first premolar
- Advance the needle toward the mental foramen.
- Depth of penetration is 5–6 mm.

Aspirate (Positive aspiration occurs 5.7%)

- If negative aspiration, **deposit approximately 0.6 mL** of anesthetic slowly over 20 seconds.
- Remove the syringe gradually.
- Safely recap the needle.
- Allow 2–3 minutes to pass before beginning planned treatment.

Mental/Incisive Nerve Block

Injection site	Mental foramen between the apices of the mandibular premolars
Nerves anesthetized	Mental and incisive nerves
Gauge	25- or 27-gauge
Needle length	Short needle
Depth	5–6 mm
Volume	0.6 mL ($\frac{1}{3}$ of a cartridge)



Mental/incisive nerve block.

Complications Associated With the Delivery of Local Anesthesia

Proper injection technique is imperative when delivering local anesthesia to minimize the risk of complications.

Hematoma

A hematoma is the result of puncturing a blood vessel during an injection. Pressure and ice should be applied to the affected area to minimize swelling/bleeding. Although a hematoma is not always preventable, accurate depth of penetration, knowledge of anatomy, and the use of a short needle for the PSA injection may minimize its occurrence.

Paresthesia

Paresthesia is the result of trauma to a nerve during the administration of local anesthesia. Patients who experience prolonged anesthesia, may have numbness or tingling lasting for days, weeks, or months. Paresthesia commonly resolves with time. Patients experiencing paresthesia for more than 1 year should be referred to an oral surgeon. Proper injection technique may minimize the occurrence of paresthesia although it is not always preventable.

Trismus

Post injection trismus results in limited opening/discomfort of the jaw caused by spasms of the jaw muscles. Although trismus is not always preventable, knowledge of anatomy, avoidance of multiple injections/insertions, and a nontraumatic technique may minimize its occurrence.

Needle Breakage

Needle breakage can be minimized by selecting a larger-gauge needle and avoiding overinsertion. In the event that the needle

breaks during an injection, the clinician should try to remove the fragment if it is visible. If the needle fragment is not visible, the patient should be referred to an oral surgeon.

Sloughing of Tissue

The prolonged application of topical anesthetic or ischemia may result in epithelial desquamation (sloughing of tissue). Clinicians should follow manufacturer's recommendations when applying topical anesthetic to ensure optimal effectiveness and avoid toxicity. Patients experiencing tissue sloughing may require systemic or topical analgesics to minimize discomfort.

Post-injection Lesions

Ulcerations/lesions may arise after an intraoral injection. Latent lesions may be activated by dental manipulation. These lesions are unpreventable. Topical analgesics may be recommended for pain management. Lesions usually resolve within 7–14 days.

A thorough assessment of the head and neck region may result in the need for the dental care provider to make appropriate referrals.

Red and Purple Lesions

Candidiasis/Erythematous Type (Acute Atrophic Candidiasis)

Etiology

Acute atrophic candidiasis is a fungal infection resulting from an imbalance in the oral ecosystem between *Lactobacillus acidophilus* and *Candida albicans*. Certain individuals may be prone to this infection. The use of broad-spectrum antibiotics, particularly tetracyclines, or use of topical steroids also can produce this infection.

Transmission

Candida infections are not easily transmittable to another individual unless that person is immunocompromised.

Location

Acute atrophic candidiasis produces desquamated areas of surface mucosa that appear as red patches. The location of the patches may indicate the cause. Lesions affecting the buccal mucosa, lips, and oropharynx suggest the administration of systemic antibiotics. Lesions found on the tongue and palate are more common after the use of antibiotic troches.

Clinical Characteristics

- **Color and surface texture:** This fungal infection produces desquamated areas of surface mucosa appearing as diffuse, flat, bright red patches. When the tongue is affected it may be devoid of filiform papillae.
- **Symptoms:** Burning and pain are the most frequent symptoms.

Dental Indications

Diagnosis is confirmed by a culture.

Treatment

The treatment for acute atrophic candidiasis is the use of an anti-fungal drug and withdrawal of offending antibiotics.

Chronic Atrophic Candidiasis (Denture Stomatitis)

Etiology

Chronic atrophic candidiasis, also known as denture stomatitis, is caused by *Candida* organisms. It is the most common form of chronic candidiasis. Denture wearers who do not remove their denture on a routine basis are frequently affected.

Transmission

Candida infections are not easily transmittable to another individual unless that person is immunocompromised.

Location

Lesions appear directly under the denture on the palate or alveolar ridge.

Clinical Characteristics

- **Color, size, and surface texture:** The earliest signs of this lesion are red pinpoint areas of hyperemia limited to the orifices of the minor salivary glands on the palate. As it progresses, it exhibits a diffuse erythematous lesion.
- **Papillary hyperplasia:** Consists of multiple small red fibroma-like papules. With time the papules may enlarge to form nodules.
- **Symptoms:** Burning and pain are the most frequent symptoms.

Dental Indications

Patient education should include proper denture care, wear, and removal to prevent these lesions from occurring or recurring. Ill-fitting dentures or traumatic influences should be eliminated to enhance healing of the affected tissues.

Treatment

Standard therapy requires the use of an antifungal agent on the mucosa and denture base. Oral appliances, dentures, and toothbrushes also must be treated. If not, reinfection can occur. Occasionally, surgical removal of the papillary hyperplastic lesion is required.

When surgical excision of this lesion is required, a new denture must be fabricated. Periodic evaluations are warranted to assess the fit of the new denture and the health of the underlying tissues.

Erythroplakia

Etiology

The term erythroplakia is defined as a persistent red patch that cannot be characterized as any other condition. Not having a histologic connotation, erythroplakias are diagnosed as epithelial dysplasias and have a much higher propensity to progress to carcinomas. Erythroplakias are often associated with tobacco and alcohol use or chronic friction and repeated exposure to irritants, producing chronic inflammation. The three clinical variants include the following:

1. The homogeneous form, or **erythroplakia**, which refers to a red patch.
2. The **erythroleukoplakia** form, which consists of red patches interspersed with white patches.
3. The **speckled erythroplakia**, which contains white specks or granules interspersed throughout the red lesion.

Not Transmissible

Location

Erythroplakias are most prevalent on the floor of the mouth, tongue, mandibular mucobuccal fold, and oropharynx. Erythroleukoplakia and speckled erythroplakia may occur on any intraoral site but commonly occur on the lateral border of the tongue, buccal mucosa, and soft palate.

Clinical Characteristics

- **Size:** Localized and circumscribed or broad and coalescing.
- **Surface texture:** Corrugated or pebbly; or can appear smooth or velvet-like.
- **Consistency:** Indurated or soft upon palpation.
- **Symptoms:** Typically these lesions are painless.

Dental Indications

The treatment plan should include a biopsy for all red-white lesions.

Treatment

Depending on the size and location of the lesion and results of the biopsy, excision of a precancerous lesion is warranted. Medical treatment depends on the histological diagnosis of the lesion. Such medical treatment modalities may include surgery, radiation, and/or chemotherapy.

Hemangioma

Etiology

This vascular lesion is composed of capillaries and venules and is a benign enlarged proliferation of blood vessels. Hemangiomas are congenital lesions that are usually present at birth or may be acquired through trauma in adulthood.

Not Transmissible

Location

Hemangiomas tend to have a higher rate of occurrence in the head and neck region. They may be seen in any soft tissue or bony intraoral site. They tend to occur more frequently on the dorsum of the tongue, lips, gingiva, and buccal mucosa.

Clinical Characteristics

- **Color:** Ranges from dark pink in the deeper tissue areas to red, blue, or purple in the superficial areas.

- **Size:** Vary in size from a few millimeters to several centimeters; they can be flat or slightly elevated.
- **Surface texture:** Predominately appear smooth-surfaced; lobular surfaces are infrequent.
- **Consistency:** Slightly firm to palpation.
- **Other descriptors:** Single lesions are most common, but multiple lesions may be seen.

Dental Indications

When differentiating hemangiomas from other vascular lesions (i.e., hematoma or Kaposi's sarcoma), the dental practitioner should apply pressure to the lesion and observe blanching.

Treatment

Most hemangiomas that occur at birth disappear after a few months or years. Most do not require treatment, but occasionally lasers, surgical excision, cryotherapy, and radiation therapy have been used when the lesion presents management problems.

Kaposi's Sarcoma

Etiology

Kaposi's sarcoma is a cancer that is associated with HIV infection. It also has been strongly associated with the human herpesvirus type 8, which is capable of promoting angiogenesis. This lesion is a tumor of vascular proliferation that affects the cutaneous and mucosal tissue. The lesions manifest as numerous vascular tumors of the skin and mucosa that may spread to the lungs, liver, or GI tract. The oral cavity is commonly the first site of involvement.

Transmission

The malignant neoplasm is not contagious but the underlying disorder, such as HIV/AIDS, is transmissible.

Location

Kaposi's sarcoma is found in the skin, oral tissues, and lymph nodes. In the oral cavity, lesions are more common on the hard palate followed by the buccal mucosa and gingiva.

Clinical Characteristics

Kaposi's sarcoma is characterized by three clinical stages:

- Initially the lesion appears as an asymptomatic red macule.
- The tumor then enlarges into a reddish-blue plaque.
- Advanced lesions appear as lobulated, purple nodules. The nodules ulcerate and cause pain.

Dental Indications

Biopsy of this lesion is required for proper diagnosis and etiology. Consultation with the supervising physician is recommended.

Treatment

Localized radiation therapy and direct injection of chemotherapeutic drugs or sclerosing agents are modes of treatment for Kaposi's sarcoma.

Lichen Planus**Etiology**

Lichen planus is a common skin disease that can have mucosal manifestations. Although the etiology is unknown, evidence suggests that lichen planus is an immunological disorder in which the T lymphocytes destroy the basal cell layer of the affected epithelium.

Not Transmissible**Location**

The most common affected site is the buccal mucosa. Less frequent sites affected are the tongue, lips, floor of the mouth, palate, and gingiva.

Clinical Characteristics

When intraoral lichen planus lesions erupt, they are usually bilateral and relatively symmetrical. Lichen planus can appear clinically either as one form or as a combination of several forms, which are classified as the following:

- **Atrophic form:** Atrophic lichen planus results from atrophy of the epithelium. It appears as red, nonulcerated mucosal patches. Very fine Wickham's striae are often present at the borders of the lesions.
- **Bullous form:** The bullous form of lichen planus presents as a raised lesion surrounded by an erythematous tissue border.
- **Erosive form:** Erosive lichen planus appears initially as a vesicle or bulla. These lesions eventually break down and produce raw, red, and ulcerative lesions with a pseudomembranous covering. Bulla vary in size but generally are greater than 1 cm in diameter. This condition can be painful. When the attached gingiva is affected, it is often referred to as **desquamative gingivitis**.

Dental Indications

Biopsy of the lesion is generally not necessary because the distinct clinical appearance can confirm the diagnosis, except for the erosive form. The erosive form has been associated with increased malignancy. When tissue changes occur biopsies are necessary.

For patients who present with chronic, symptomatic lichen planus, a suggested home-care regimen includes the use of nonharsh and nonalcohol-containing oral hygiene products. Patients are encouraged to continue maintenance appointments at regular intervals to monitor the complexity of this disorder. Minimal manipulation of the oral tissues is emphasized during dental procedures.

Treatment

Described as an unpredictable and possibly a life-long disorder, lichen planus presents with periods of remission and reoccurrence. When the lesions become ulcerated or significant changes are observed, topical or systemic corticosteroids may be prescribed.

Lifestyle changes are highly encouraged to reduce physiological and/or psychological stressors that can have a dramatic effect on the resolution of the lesions.

See reticular/striate and plaque forms of lichen planus in the White Lesions section of this tab.

Purpura

Etiology

Purpura are circumscribed areas of pooled extravasated blood into the surrounding skin. The causes can be iatrogenic, or unintentional or accidental trauma to vascular tissues contained within the skin or submucosa. In situations where the etiology is unknown or trauma is not the cause, quantitative or qualitative deficits in platelets, clotting factors, capillary fragility, or infection should be suspected. The three types of purpura include **petechiae**, **ecchymoses**, and **hematomas**. Frequent bruising or bleeding also may be associated with purpura, petechiae, or ecchymoses depending on its etiology.

Not Transmissible

Clinical Characteristics

- **Purpuras** are circumscribed hemorrhagic lesions that are larger than petechiae, usually greater than 3 mm in diameter, on the skin or mucosa. Initially these lesions appear bright red and tend to discolor with time becoming purplish-blue and later brown-yellow in color. The appearance of these lesions may possibly indicate platelet/bleeding disorders or trauma.
- **Petechiae** are 1 to 2 mm circular, purplish spots that can appear on the skin or mucous membrane as a result of a minute hemorrhage. The most common intraoral site is the soft palate possibly indicating an early sign of viral infection, leukemia, blood dyscrasias, or rupture of palatal capillaries.
- **Ecchymoses** are areas of extravasated blood larger than a purpura and usually greater than 1 cm in diameter.

They range in color from red-purple and later blue-green. Causes include use of anticoagulant drugs, trauma, blood disorders, Cushing's disease, or cancers.

- **Hematomas** are considered large pools of extravasated blood resulting from trauma to the blood vessels. Hematomas can occur in the oral cavity from trauma to the face, during tooth eruption or because of rupture to the posterior superior alveolar vein during the delivery of local anesthesia. Color ranges from dark red to reddish-brown and symptoms include tenderness to palpation.

Dental Indications

It is prudent that the dental professional obtain a comprehensive medical history to determine the underlying cause so that invasive dental treatment can be safely provided. Patients who present with a blood dyscrasia or disease may require special care when receiving dental treatment.

Treatment

Treating the underlying cause or removing sources of trauma is necessary to stop the development of petechiae, ecchymoses, and purpura. These types of lesions associated with trauma fade with time when the offending source is removed and require no specific treatment.

Pyogenic Granuloma

Etiology

Pyogenic granulomas are benign overgrowths of tissue resulting from chronic trauma or local irritation. The lesions often appear in pregnancy due to the increase in hormones. In addition to hormonal changes, pyogenic granulomas are associated with trauma and reactions to foreign materials or irritants. They are composed of hyperplastic granulation tissue and a large number of capillaries.

Not Transmissible

Location

Oral granulomas most commonly appear on the gingiva. They also can appear on the lower lip, tongue, and buccal mucosa.

Clinical Characteristics

- **Color:** Ranges from shades of pink to bright red; incipient lesions appear deep red to purple and mature lesions appear pink in color. When the inflamed lesion ulcerates, it then is replaced with more fibrous tissue making it appear yellow in color.
- **Size:** Ranges from a few millimeters to several centimeters.
- **Consistency:** The inflammatory tissue can become ulcerated or fibrotic.
- **Surface texture:** Lobular, smooth, or papillary surface texture can be observed.
- **Other descriptors:** Can appear pedunculated (stalk-like) or sessile-based (flat-based).
- **Symptoms:** Typically, these lesions are painless.

Dental Indications

If the pyogenic granuloma does not resolve itself, excision is recommended.

Treatment

Reoccurrence of a pyogenic granuloma is possible if the irritant is not eliminated.

Pigmented Lesions

Amalgam Tattoo

Etiology

Amalgam tattoos are caused by intentional or accidental implantation of amalgam particles into the mucosal tissues. Amalgam remnants usually become embedded during tooth restoration or extraction. Deterioration of the silver particles of the amalgam results in the characteristic blue-black color.

Not Transmissible

Location

Localized in areas adjacent to an amalgam restoration, gold casting, or in open wound areas. Most commonly amalgam tattoos are found on the gingiva; however, they may also be present on the buccal mucosa, an edentulous ridge or floor of the mouth.

Clinical Characteristics

- **Color:** Color ranges from grey to blue-black.
- **Size and shape:** Usually irregular in shape and variable in size.
- **Surface:** Flat.

Radiographic Characteristics

- **Radiographic:** Opaque fragments of metal may be apparent in radiographs.

Dental Indications

Clinical and radiographic assessments are important to rule out more serious pigmented lesions or pathology.

Treatment

Treatment is not indicated.

Smoker's Melanosis

Etiology

Smoker's melanosis, also known as **tobacco-associated melanosis/pigmentation**, is caused by an increase in the production of melanocytes due to smoking.

Not Transmissible

Location

Smoker's melanosis predominately affects the lips, buccal mucosa, and anterior gingiva. Other susceptible sites include the palate, floor of the mouth, and tongue.

Clinical Characteristics

Smoker's melanosis presents as diffuse, irregular-shaped, light to dark brown pigmentation. The amount of tobacco used determines the degree of pigmentation. It can present from diffuse patches to generalized bands.

Dental Indications

The oral inspection usually reveals brown-stained teeth and halitosis. Smoker's melanosis is not a premalignant condition but the use of tobacco products increases one's risk of oral cancer. Thus, dental professionals must carefully examine the adjacent tissues for other tobacco-induced lesions, which may be more serious.

Treatment

A smoking/tobacco cessation program should be recommended. Discontinuing the use of tobacco products may resolve pigmentation.

Raised Papillary Lesions

Oral Squamous Papilloma

Etiology

Human papillomaviruses (HPV).

Transmission

Human papillomaviruses are transmitted by direct contact with the virus and by autoinoculation.

Location

HPV is most commonly found on the palate and the tongue. However, it can also be found on the lips and mucosa.

Clinical Characteristics

- **Color:** Ranges from white to pink.
- **Surface texture:** Papillary surface described as cauliflower-like texture or finger-like projection.

- **Symptoms:** Typically these lesions are painless.
- **Other descriptors:** Well-circumscribed, raised, pedunculated or sessile mass.

Dental Indications

HPV lesions should be referred for excision and biopsy.

Treatment

Surgical excision is the standard treatment. These lesions may reoccur in immunocompromised individuals.

Papillary Hyperplasia

Etiology

Papillary hyperplasia is caused by chronic trauma usually the result of friction due to an ill-fitting denture.

Not Transmissible

Location

These lesions are more commonly found on the palatal mucosa directly beneath the denture.

Clinical Characteristics

- **Color:** Color ranges from pink to bright red.
- **Consistency:** Firm upon palpation.
- **Surface texture:** Clustered fibroma-like papules; may progress to form nodules.

Dental Indications

Patient education should include proper denture care, wear, and removal to prevent these lesions from occurring or recurring. The ill-fitting denture must be examined by the dentist to evaluate the need for a soft-tissue reline or the fabrication of a new denture.

Treatment

When surgical excision of this lesion is required, a new denture must be fabricated. Periodic evaluations are warranted to assess the fit of the new denture and the health of the underlying tissues.

Enlargements of Soft Tissue

Epulis Fissuratum (Irritation Hyperplasia)

Etiology

Fibromas are caused by chronic trauma or irritation. The chronic trauma or irritant causes a reactive hyperplasia, producing an inflammatory, fibrous connective tissue enlargement. One such common lesion is termed **epulis fissuratum** or **denture-induced fibrous hyperplasia**, which results from the flange area of a poorly fitting complete or partial denture. The overextended margin of the denture produces an ulcer that heals incompletely because of repeated trauma.

Not Transmissible

Location

Epulis fissuratum lesions are usually found in the mucolabial fold of the anterior region of the maxilla, followed by the mandibular alveolar ridge and the mandibular lingual sulcus.

Clinical Characteristics

- **Color:** Same color or slightly lighter than the surrounding tissue; when these lesions are inflamed they are pink-red in color.
- **Size/shape:** Initially it begins as a single fold of soft tissue and may progress to several folds of tissue.
- **Surface texture:** Smooth surface texture or the surface may be ulcerated.
- **Consistency:** Firm and fleshy.
- **Symptoms:** Typically these lesions are painless.

- **Other descriptors:** Nodular and exophytic; possibly pedunculated; the tissue may appear folded with the flange of the denture fitting between the folds of the tissue.

Dental Indications

The goal of the dental professional is to identify the cause of the irritation or trauma producing the fibroma and to remove the cause so that the lesion reduces in size. When the denture is the cause of trauma, the clinician must evaluate the “fit” of the denture. A new denture may need to be fabricated. Patient education should include proper denture care, wear, and removal to prevent these lesions from occurring or recurring.

Treatment

Surgical removal of the excess/hyperplastic tissue is the recommended treatment. The source of trauma must be removed to prevent reoccurrence.

Gingival Hyperplasia

Etiology

Generalized gingival hyperplasia or generalized gingival enlargement is caused by a number of different factors including chronic inflammation associated with dental biofilm; calcium channel blockers, which are prescribed for cardiovascular conditions; cyclosporin, which is prescribed as an immunosuppressant for patients who have had organ or tissue transplants; phenytoin, which is prescribed as an anticonvulsant; hormonal changes in puberty and pregnancy associated with an exaggerated response to local factors; genetics; and leukemia.

Not Transmissible

Location

Gingival hyperplasia can be localized to the interdental papilla or generalized to the marginal, papillary, and attached gingiva. It appears most exaggerated on the gingiva of the anterior teeth.

Clinical Characteristics

- **Color:** Pink to red in color depending on the degree of inflammation.
- **Size:** Localized to generalized, slight to severe enlargement of the gingival tissue; with time, the tissue can completely cover the crowns of the teeth.
- **Consistency:** Firm, lumpy nodules.

Dental Indications

The dental clinician should obtain a comprehensive medical history to assist with a diagnosis.

Treatment

Treatment may include a consult with the prescribing physician to discuss altering the offending medication. Patients must be educated about optimal oral hygiene. Surgical removal of the excess tissue may be required.

Ulcerative Lesions

Aphthous Ulcers

Description

Aphthous ulcers also are known as **recurrent aphthous ulcers** (RAUs), **canker sores**, or **aphthous stomatitis**. They are the most commonly seen ulcerations in the oral cavity. The three categories of RAUs include:

- **RAU-Minor:** This is the most common form of the three types. These ulcers are less than 1 cm in diameter and usually range in number from 1 to 5.
- **RAU-Major:** This chronic form is much less common in occurrence. This form is the largest of the three types ranging from 1 to 3 cm in diameter and usually range in number from 1 to 10. They appear deeper and more craterlike with an irregular border; many result in scarring of the tissue.
- **RAU-Herpetiform:** These are the smallest of the three and tend to appear in cluster formations that usually coalesce to produce a larger lesion. They measure approximately

1 to 3 mm in diameter and usually range in number from 10 to 100.

Etiology

Stress, trauma, food allergies, endocrinopathies, nutritional deficiencies, genetic predisposition, hormonal imbalance, menstruation, autoimmune response, and an immunosuppressed host are all etiological factors associated with aphthous ulcers.

Not Transmissible

Location

RAUs most likely appear on unkeratinized tissue such as the buccal and labial mucosa, ventral surface of the tongue, floor of the mouth, soft palate, and posterior oropharynx. The herpetic type appear on keratinized tissues and are preceded by vesicle formation.

Clinical Characteristics

- **Prodromal symptoms:** A tingling or burning sensation may occur.
- **Intraoral Characteristics**
 - **Color and shape:** Lesions appear as shallow, yellow-gray, oval-shaped ulcers, surrounded by an erythematous border.
 - **Duration:** RAU-Minor form lasts from 7 to 14 days; the major forms may last for weeks and eventually heal with evidence of scarring.
 - **Symptoms:** Both forms may be accompanied by pain.

Treatment

Depending on the severity and type of ulcers, over-the-counter medications and corticosteroid gels are topically applied. Minor aphthous ulcers heal within 14 days regardless of the treatment. Major forms of ulcers may last for weeks and leave scarring.

Hypersensitivity Reactions

Etiology

The primary type of hypersensitivity reaction that occurs in the patient's mouth is termed a **delayed hypersensitivity reaction** or a **Type IV reaction** that is a response of the immune system. Hypersensitivity reactions are caused by the introduction of a local or systemic allergen such as medication or an exposure to a dental product. Type IV reactions are usually delayed and can take 24 to 72 hours or more for a full response to be observed.

Not Transmissible

Clinical Characteristics

- **Extraoral characteristics:** Hives (urticaria) of various sizes will appear as a result of an allergic reaction; itchiness (pruritus) may accompany these lesions.
- **Intraoral characteristics:** Various tissue reactions may occur including vesicles, ulcers, erythematous tissue, and a rash with macules.

Dental Indications

Patients who present with a history of hypersensitivity reactions have a predisposition and may react to products used in the dental office.

Treatment

Dental personnel must obtain a comprehensive medical history in order to identify offending products that may cause a hypersensitivity reaction. It is expected that the dental office medical emergency protocol is in place and the medical emergency kit contains the proper agents to treat such reactions.

Necrotizing Ulcerative Gingivitis

Etiology

Necrotizing ulcerative gingivitis (NUG) is a gingival disease that causes bleeding, pain, tissue ulceration, and tissue necrosis.

NUG is linked to specific bacterial species, stress, poor oral hygiene, smoking, and immunocompromised status.

A number of different oral spirochetes are associated with NUG. Specifically and more commonly found organisms are *Actinomyces* species, *Selenomonas*, *Porphyromonas gingivalis*, *Treponema*, and *Fusobacterium* species. This condition is characterized by fever, lymphadenopathy, malaise, fiery red gingiva, extreme oral pain, hypersalivation and a distinct offensive odor.

Transmission

Individuals are predisposed to this disease due to a decreased resistance to infections.

Clinical Characteristics

- **Intraoral characteristics:** Acute swelling of the gingival margin; interdental papillae are punched out, ulcerated, and covered with a pseudomembrane; severe redness of the gingiva with bleeding may appear; a fetid odor is present and the patient may complain of a metallic taste.
- **Symptoms:** Fever, pain, and lymphadenopathy may be experienced by the patient.

Dental Indications

Dental treatment includes gentle debridement of the teeth to remove the pseudomembrane, necrotic tissue, and debris. No power instrumentation scaling devices should be used in an effort to prevent aerosolization and bacteremia.

Treatment

Patient education should include oral hygiene instructions, stress reduction protocol, nutritional counseling, and rest. In addition, warm salt-water rinses, mixtures of peroxide with equal parts water, or chlorhexidine two times a day may be recommended. When systemic symptoms are present, antibiotics should be prescribed. Oral hygiene must be continued along with other recommended general health practices.

Squamous Cell Carcinoma

Etiology

Squamous cell carcinoma (SCC) is a malignant neoplasm that often appears as a chronic, nonhealing ulcer. In its early stage, the lesion is usually small, nonpainful, and nonulcerative. As it progresses, the disease results in neoplastic proliferation that exhausts the blood supply resulting in an ulcer-like appearance formation. The later stage of the lesion tends to be large and crater-like, covered by a necrotic layer. The etiology of SCC is complex. Factors that have been associated with the disease include sunlight, tobacco, alcohol, diet, stress, infections, viruses, and chemical industrious hazards.

Transmission

Oral cancer is not contagious. However, the human papilloma virus, which is transmissible, has been linked to certain types of cancers.

Location

SCC appears more predominately on the ventral and lateral borders of the tongue, the floor of the mouth, salivary glands, and gingiva. Other high-risk sites include the lip, retromolar region, tonsillar area, and palate.

Clinical Characteristics

SCC lesions exhibit a variety of clinical appearances, but many cases exhibit erythroplakia. Most of these lesions are found to be either dysplastic or malignant. Other lesions present as erythroleukoplakia or speckled erythroplakia both of which are highly suspicious.

Dental Indications

Dental professionals must obtain a comprehensive medical history to identify risk behaviors and associated factors relative to the development of head and neck cancers. It is imperative that dental professionals perform an oral cancer screening and a

thorough extra/intraoral examination on a routine basis. When a suspicious lesion is observed a biopsy is indicated.

Treatment

Primarily, treatment is based on the stage of the cancerous lesion. Surgical incision, radiation therapy, and/or chemotherapy are modes of treatment for SCC.

Syphilis

Etiology

Syphilis is a venereal disease caused by the anaerobic spirochete *Treponema pallidum*.

Transmission

The mode of transmission is through direct contact with the primary lesion during vaginal, oral, or anal sex; from mother to fetus during birth; or a blood transfusion. The spirochete organism dies quickly on dry surfaces or when it is exposed to air.

Pathogenesis

Syphilis involves a progression of three major stages when untreated: **primary stage**, **secondary stage**, and the **tertiary stage**. After the secondary stage, there is a period of latency that can last for years until it progresses into the tertiary stage.

Primary Stage

Incubation of 12 to 30 days.

Characteristics

- **Chancre:** A localized, painless, firm, indurated, ulcer-like lesion that becomes eroded at the affected site. The lesion is generally 2 to 3 cm in diameter. At this stage, the surface is covered by a yellowish, infectious serous discharge. The lesion will persist for 2 to 4 weeks and heal spontaneously.
- **Patchy alopecia:** Patches of hair loss.

Secondary Stage

Develops 4 weeks to 6 months after the primary stage.

Characteristics

- Flu-like symptoms with fever and weight loss may be present.
- Nontender lymphadenopathy may be present.
- Skin lesions termed **mucous patches** appear. They are highly infective ulcer-like lesions with a pseudomembranous covering of a yellow, white, or grey color surrounded by a red halo.
- Bilateral skin rash appears.

Latency Period

Can last for decades.

Characteristics

- The disease appears dormant.

Tertiary Stage

Characteristics

- **Gumma:** Indurated mass that develops into an ulceration causing severe tissue destruction in the localized area/organ system. May appear on the face, extremities, and genitals.
- Affects cardiovascular system and central nervous system (CNS).
- Altered mental state.

Congenital Syphilis

Characteristics

- The organism that infects the pregnant mother is passed along to the developing fetus. High risk of stillborn baby.

Hutchinson's triad

- Mulberry molars and notched incisors are evident.
- Inflammation of the cornea may occur.
- Eighth nerve deafness may occur.
- Nasal deformity and excessive bone growth may occur.

Treatment

The drug of choice for treating all stages of syphilis is Penicillin G. If treatment is not initiated, severe damage to organs may occur.

Traumatic Ulcers

Etiology

Traumatic ulcers may occur when patients traumatize the oral tissue because of external forces or frictional injury. Traumatic ulcers may result from chemicals, heat, electricity, or mechanical force. Examples include improper alignment of teeth, dentures that do not fit properly, a fractured tooth or restoration, or chronic cheek biting.

Not Transmissible

Location

Traumatic ulcers can involve the lips or any location in the oral cavity.

Clinical Characteristics

- **Extraoral characteristics:** Traumatic ulcers involving the lips can appear crusted and bleed.
- **Intraoral characteristics:**
 - **Color:** Intraoral ulcers appear slightly depressed with a yellow-gray center and an erythematous border. When repeated trauma occurs, ulcers may exhibit a thickened, keratinized, white appearance.
 - **Size:** Varies; lesions are typically oval in shape.
 - **Symptoms:** Patients may experience slight discomfort.

Dental Indications

Traumatic ulcers may cause discomfort to the patient; thus, dental treatment should be postponed until the lesion has healed.

Treatment

Traumatic ulcers are usually of short duration. Removing the source of injury should allow the tissue to heal. Examination of the tissue within 2 weeks is recommended to evaluate resolution of the ulcer and determine if further evaluation is necessary.

Tuberculosis

Etiology

The bacterium that is associated with tuberculosis is *Mycobacterium tuberculosis* (*M. tuberculosis*).

Transmission

Tuberculosis is spread through airborne transmission by inhaling microscopic particles containing the *M. tuberculosis* organism or by direct contact with a contaminated surface.

Clinical Characteristics

- **Extraoral characteristics:** Lung lesions develop with active disease.
- **Intraoral characteristics:** Oral tuberculosis lesions appear as painful, nonhealing ulcers found most often on the tongue, labial mucosa at the commissures of lips, gingiva, or palate, but can appear on any mucosal surface. The center of the ulcer is necrotic, yellow-gray in color, and depressed. The margin of the lesion is irregular. The periphery of the ulcer usually appears lumpy and cobblestoned.

Dental Indications

! Dental treatment must be postponed if the patient presents with active tuberculosis.

Treatment

Individuals who do not have active disease but are infected with the organism are treated with isoniazid for 6 to 9 months. Individuals who present with active disease are treated with a combination of drugs: isoniazid, rifampin, pyrazinamide, and either ethambutol or streptomycin. Patient compliance with the drug regimen is vitally important.

Vesicle Lesions

Herpes Simplex Virus

Description

Herpes simplex virus (HSV) is a member of the human herpesvirus (HHV). Of the eight human herpes viruses, HHV 1 and HHV 2 are associated with the simplex viruses and systemic diseases. HHV 1 is commonly associated with oral conditions; HHV 2 is associated with genital herpes. However, HHV 2 may be found in the oral cavity because of oral-genital transmission and HHV 1 can be the root of genital herpes.

Human Herpesvirus Type 1 (HHV 1)

Description

HHV 1 is seen in the oral cavity. It presents as **primary herpetic gingivostomatitis** and as **secondary** or **recurrent herpes**.

Primary Herpetic Gingivostomatitis

Etiology

Primary herpetic gingivostomatitis is caused by the organism herpes simplex virus 1 (HSV-1).

Transmission

Primary herpetic gingivostomatitis is a contagious disease. Transmission occurs through direct mucocutaneous contact of infected oral secretions. The virus is technically transmitted through saliva and has an affinity toward the eyes, lips, oral cavity, and pharynx.

Pathogenesis

The virus can emerge as either a subclinical or clinical infection. When flu-like clinical symptoms appear, the infection is called primary herpetic gingivostomatitis. The virus may migrate along the trigeminal nerve and remain dormant until a reoccurrence. Recurrent episodes are termed **secondary infection**.

Location

Perioral and intraoral features appear on mucosal or cutaneous surfaces.

Clinical Characteristics

Initially, localized areas of the marginal and papillary gingiva become fiery red, swollen, and bleed with minimal trauma. Generalized inflammation of the marginal and attached gingiva develops. Concurrently, clusters of small vesicles erupt on the lips, gingiva, tongue, mucosa, and occasionally on the perioral skin. The vesicles rupture spontaneously and leave yellowish ulcerations surrounded by an erythematous border. On the perioral areas, the vesicles exhibit hemorrhagic crusts while healing.

- **Prodromal symptoms:** The individual experiences extreme pain, elevated temperature, generalized malaise, cervical lymphadenopathy, and a sore throat.

Dental Indications

Routine dental treatment should be postponed when lesions are present to avoid spreading the virus.

Treatment

Lesions generally resolve within 7 to 14 days. Nonaspirin antipyretic drugs and antibiotics are recommended when patients present with a high temperature. Palliative treatment includes a soft diet and avoidance of acidic and carbonated liquids. Patients may rinse with a prescription mixture of Benadryl elixir and Kaopectate to alleviate discomfort. Antiviral medication is most effective if taken before lesion formation.

Recurrent Herpes Simplex Infection (Secondary Infection)

Etiology

Recurrent herpes simplex infections are caused by reactivation of the latent HSV-1. Recurrences are precipitated by stress, sun exposure, infection, compromised immune system, trauma, pregnancy, menstruation, systemic disease, and manipulation of oral tissues.

Transmission

Viral particles can be transmitted to other individuals and to other areas of the affected individual's body by direct contact with the infected vesicular fluid.

Pathogenesis

Reactivation of this cyclical virus occurs when the dormant virus in the nerve ganglion is activated. The virus moves along the trigeminal nerve and infects the epithelial cells of the mucosa.

Clinical Characteristics

- **Prodromal symptoms:** Before the appearance of vesicles, localized symptoms such as burning, tingling, or pain may be experienced.
- **Extraoral characteristics:** Localized clusters of vesicles are evident on the vermillion border of lips and may extend to perioral areas. These lesions are termed **herpes labialis**. Lesions appear as small clusters of vesicles that erupt, coalesce, ulcerate, form a scab, and heal without scarring.
- **Intraoral characteristics:** Localized unilateral small vesicles may erupt on the palatal or attached gingiva. These lesions are termed **recurrent herpetic stomatitis**.

Dental Indications

Routine dental treatment should be postponed when lesions are present to avoid spreading the virus.

Treatment

For herpes labialis, early application of topical antiviral ointments or creams during the prodromal phase may reduce the spreading and duration of the virus. For reducing the duration of intraoral lesions, oral antiviral medication such as acyclovir is recommended and most effective when taken during the prodromal phase. Spontaneous regression of the recurrent herpes lesion occurs between 7 and 14 days.

Mucocele

Etiology

A mucocele results from spillage of mucus into the adjacent subepithelial tissues when a salivary gland duct is severed or traumatized. Consequently, mucus is walled-off to form a cyst-like structure that is surrounded by compressible granulation tissue. A **ranula** is a variant mucocele that is located on the floor of the mouth caused by trauma to the sublingual gland duct or to the submandibular gland duct.

A mucocele is distinguished from a salivary duct cyst, known as a **mucus retention cyst**, when the cyst is lined with epithelium. Resulting from a blockage, a localized swelling of the duct appears. The mucus retention cyst may result from a salivary gland stone, known as a **sialolith**, or from duct scar tissue that causes obstruction of the involved salivary gland.

Location

Mucoceleles are more common in the lower lip midway between the midline and commissure. Mucoceleles also can occur anywhere that minor salivary glands are found including the buccal mucosa, ventral surface of the tongue, floor of the mouth, and palate.

Clinical Characteristics

- **Color:** May have a bluish-gray hue with a slight transparent appearance when located near the mucosal surface; if located deeper in the tissue, they present with a normal color.
- **Size:** Varies from 1 mm to several centimeters.
- **Consistency:** Soft and fluctuant.
- **Contour:** Smooth appearance.
- **Symptoms:** Asymptomatic.

Dental Indications

Trauma may be evident due to the likelihood that the elevated tissue may be traumatized during normal oral functions. Clinical

characteristics and the location of the mucocele should be documented.

Treatment

Superficial mucoceles will most likely subside spontaneously or rupture leaving an ulcer-like lesion. Surgical excision is considered when mucoceles are persistent and/or interfere with normal function.

Mucous Membrane Pemphigoid (Cicatricial Pemphigoid, Benign Mucous Membrane Pemphigoid)

Etiology

When limited to the gingiva, the term **desquamative gingivitis** is used in preference to mucous membrane pemphigoid (MMP).

Not Transmissible

Clinical Characteristics

Oral MMP exhibits erythematous, shiny, red gingiva. The gingiva is the target site for MMP and it may be present in localized or generalized areas. The clinical characteristic of desquamative gingivitis is highly friable gingival tissue that sloughs, leaving a painful, burning, erythematous and/or ulcerated surface.

Dental Indications

During routine dental procedures, gentle tissue manipulation is recommended. Alcohol-containing products and abrasive dental products must be avoided. The patient's oral hygiene regimen must be optimal, while avoiding irritating dental products and following a bland diet.

Treatment

Moderate doses of dapsone and corticosteroids, alone or in conjunction with immunosuppressants, have provided effective management.

Noninfective Vesiculobullous Disease—Autoimmune Disease

Pemphigus Vulgaris

Description

Pemphigus vulgaris is an autoimmune disease that is characterized by a vesiculobullous disease of the epithelium. The **vulgaris** and **vegetans** types have intraoral manifestations.

Etiology

Pemphigus vulgaris is caused by autoantibody destruction of critical adhesion proteins of epithelium that comprise the desmosomes. (Desmosomes are the intercellular glue-like substance that holds epithelial cells together.) Events that trigger this autoantibody destruction are unknown.

Not Transmissible

Location

Pemphigus most frequently involves the buccal mucosa, gingiva, palate, floor of the mouth, and lips. Bullae appear less frequently on the tongue and oropharynx.

Clinical Characteristics

As a result of the destruction of the attachments, multiple intraepithelial blisters are produced. They rupture quickly leaving painful erosions (ulcer-like lesions) of the skin and oral mucosa. During the rupture phase (collapsed bullae), the bullae form weeping lesions described as clear gelatinous plaques. They are extremely fragile and rapidly disintegrate, bleed, and crust. When light lateral pressure is applied to the intact bullae, it causes the blister to enlarge. This clinical characteristic is known as **Nikolsky's sign**. The clinical appearance of the collapsed bulla is described as a whitish, superficial covering that can be easily wiped away. Feter oris is common among these affected patients.

Dental Indications

Early recognition of oral lesions is important because they precede skin lesions by several months. Thus, the diagnosis of pemphigus is made by a positive Nikolsky's sign, biopsy of the lesions, and immunofluorescent staining. When providing dental services, dental professionals must gently manipulate the oral tissues to avoid inducing pain. Alcohol-containing products and abrasive dental products must be avoided. The patient's oral hygiene regimen must be optimal while avoiding irritating dental products and following a bland diet.

Treatment

Remission and management of the lesions are achieved with the use of corticosteroid and immunosuppressive agents.

Primary Varicella-Zoster

Etiology

The human herpesvirus type 3, the varicella-zoster virus, is the cause of primary varicella infection known as chickenpox. Vaccines are available to children who have not been infected with the virus.

Transmission

Known as a highly contagious disease, transmission occurs by way of droplets or direct contact with the lesions.

Pathogenesis

Normally infecting the respiratory tract, the virus is carried through the bloodstream and into the skin. After an incubation period that lasts approximately 14 to 21 days, mild prodromal symptoms appear. The virus resolves within 2 to 3 weeks or when all lesions are crusted with no apparent exudate. The virus may lie dormant in ganglia until triggered later to emerge as herpes zoster, known as shingles in adults.

Clinical Characteristics

The rash is followed by the eruption of papules that form vesicles and pustules. These lesions burst and crust over.

- **Prodromal symptoms:** Symptoms usually begin with a fever, chills, sore throat, malaise, slight lymphadenopathy, and upper respiratory congestion followed by a red, itchy rash on the trunk, head, neck, and extremities.
- **Intraoral characteristics:** Vesicular intraoral lesions erupt predominately on the soft palate. Others erupt on the lips and buccal mucosa. Upon bursting, the vesicles produce ulcer-like lesions with an erythematous halo.

Dental Indications

Routine dental treatment should be postponed until lesions have healed within the oral cavity and on the body.

Treatment

Palliative care includes use of topical preparations to relieve pruritus and nonaspirin antipyretics for any discomfort. This self-limiting infection resolves within 2 to 3 weeks.

Secondary Varicella-Zoster (Shingles or Herpes Zoster)

Etiology

Shingles or herpes zoster is caused by the reactivation of the latent varicella-zoster virus. Stress, immunosuppression, aging, and debilitating disease states are associated with triggering an outbreak of the virus.

Not Transmissible

Pathogenesis

The varicella-zoster virus may migrate over sensory nerves to lie dormant until triggered later in life. When activated, it erupts either in the dorsal ganglion or the trigeminal ganglion. If the trigeminal nerve is affected, the virus will appear on the

ophthalmic branch, the maxillary branch, or the mandibular branch.

Clinical Characteristics

Painful vesicular lesions erupt on the skin and mucosa in a unilateral pattern distributed along nerve pathways. The two areas of the body most affected are the trunk and the face along the ophthalmic division of the trigeminal nerve.

- **Prodromal symptoms:** Pain, numbness, itching, tingling, or burning.
- **Intraoral characteristics:** Localized unilateral small vesicles may appear on any mucosal surface or on the palate.

Dental Indications

Shingles is a self-limiting condition. Infrequent complications include post herpetic neuralgia, facial paralysis, diminished hearing, vertigo, spontaneous tooth exfoliation, and necrosis of the mandible. If the ophthalmic division of the trigeminal nerve is affected, blindness may occur.

Treatment

Recommended therapy includes isolating the individual, local/palliative management of the lesions, use of pain medication/antiviral medication, and treatment of herpetic neuralgia.

White Lesions

Chronic Hyperplastic Candidiasis

Etiology

Hyperplastic candidiasis is caused by a species of *Candida* that penetrates the mucosal surface and stimulates a hyperplastic response. Predisposing factors include chronic irritation, poor oral hygiene, xerostomia, smoking, and dentures. Systemic diseases such as diabetes mellitus and HIV infection can also be involved. This type of candidiasis is the rarest form of yeast infections and is considered premalignant.

Transmission

Candida infections are not easily transmittable to another individual unless that person is immunocompromised.

Location

Lesions commonly affect the tongue, palate, buccal mucosa, and commissures of lips.

Clinical Characteristics

Hyperplastic candidiasis manifests as thickened multiple, raised, white or gray plaques that do not wipe off.

Dental Indications

Because of the white color of the lesion and the clinical feature that it does not wipe off, a biopsy is warranted for a diagnosis.

Treatment

Treatment includes antifungal medication, laser surgery, and conventional surgical excision.

Geographic Tongue

Etiology

Geographic tongue, also known as benign **migratory glossitis**, is a common inflammatory, mucosal disorder associated with desquamation of superficial keratin and filiform papillae.

Not Transmissible**Location**

Geographic tongue is located on the dorsum and lateral surfaces of the tongue. Lesions also may affect the ventral surface.

Clinical Characteristics

Geographic tongue manifests in three different patterns:

1. Patchy areas of desquamated filiform papillae.
2. Patchy desquamated areas surrounded by raised, white lines.

3. Patchy areas of desquamated filiform papillae with or without the encircling white lines, bordered by an erythematous band of inflammation.

A combination of these patterns may be present and continuously change; thus, the term **migratory glossitis** is used.

Symptoms

In the presence of the erythematous band of inflammation, irritation by spicy and acidic foods may cause pain.

Dental Indications

The distinct clinical characteristics seldom require biopsy for a diagnosis.

Treatment

No treatment is necessary. The condition may appear suddenly and persist for an unspecified and prolonged period of time. Spontaneous remissions and recurrences are expected.

Hairy Leukoplakia

Etiology

The appearance of hairy leukoplakia is significant in that it indicates immunosuppression. This lesion is seen almost exclusively in patients infected with HIV/AIDS, patients with immunosuppression resulting from drugs taken for organ transplantation, or persons with systemic disease. Replication of the Epstein-Barr virus within the affected epithelial cells appears to be causative.

Not Transmissible

Location

Hairy leukoplakia is located bilaterally on the lateral borders of the tongue, but may extend onto the dorsal and ventral surfaces. This lesion may also be found on the palate and buccal mucosa.

Clinical Characteristics

Hairy leukoplakia presents as white vertical raised folds that may eventually coalesce to form discrete white plaques or extensive thick white corrugated patches. These lesions are asymptomatic and do not wipe off.

Dental Indications

Because of the white color of the lesion and the clinical feature that it does not wipe off, a biopsy is warranted for a diagnosis.

Treatment

Treating the Epstein-Barr virus with antiviral agents may eliminate the lesion or reduce its size.

Leukoplakia**Etiology**

Leukoplakia is a clinical term defined by the World Health Organization as “a white patch or plaque [on the oral mucosa] that does not rub off and cannot be diagnosed clinically or pathologically as any specific disease.” The most important etiological factor associated with leukoplakia is tobacco, including cigarettes, cigars, and snuff. However, leukoplakia lesions may occur in non-tobacco users.

Not Transmissible**Location**

The predominant sites for leukoplakia are the lateral and ventral surfaces of the tongue, floor of the mouth, alveolar mucosa, lip, soft palate extending onto the retromolar area, and the attached gingiva on the mandibular arch.

Clinical Characteristics:

- **Color:** Ranges from slightly translucent white, gray, or brown-white.
- **Size:** Variable.
- **Surface texture:** May appear smooth and homogeneous, thin and friable, fissured, corrugated, and/or verrucoid.

- **Symptoms:** Typically these lesions are painless.
- **Other descriptors:** May appear nodular or speckled.

Dental Indications

Because of the white color of the lesion and the clinical feature that it does not wipe off, a biopsy is warranted for a diagnosis.

Treatment

Nondysplastic lesions generally resolve with the cessation of tobacco use. When lesions are diagnosed as dysplastic, they are managed by eliminating risk factor(s) and surgical removal.

Lichen Planus

Etiology

Lichen planus is a common skin disease that can have mucosal manifestations. Although the etiology is unknown, the evidence suggests that lichen planus is an immunological disorder in which the T lymphocytes destroy the basal cell layer of the affected epithelium.

Not Transmissible

Location

The buccal mucosa in the lower mucobuccal fold and less frequently the gingiva.

Reticular Form

Clinical Characteristics

The reticular or striate form of oral lichen planus produces several delicate white lines and tiny papules arranged in a lacey, web-like pattern, known as **Wickham's stria**. The white areas are often asymptomatic and do not wipe off, but some patients may complain of textural changes.

Plaque Form

Clinical Characteristics

The plaque form of oral lichen planus appears as a whitish plaque.

Dental Indications

Biopsy of these lesions is generally not necessary because the distinct clinical appearance can confirm the diagnosis, except for the erosive form. The erosive form has been associated with increased malignancy. When tissue changes occur biopsies are necessary.

For patients who present with chronic, symptomatic lichen planus, a suggested home-care regimen includes use of non-harsh and non-alcohol containing oral hygiene products. Patients are encouraged to continue maintenance appointments at regular intervals to monitor the complexity of this disorder. Minimal manipulation of the oral tissues is recommended during dental procedures.

Treatment

Lichen planus presents with periods of remission and reoccurrence. The reticular and plaque forms of lichen planus are asymptomatic and usually do not require treatment. When the lesions become ulcerated or significant changes are observed, topical or systemic corticosteroids may be prescribed. Lifestyle changes are highly encouraged to reduce physiological and/or psychological stressors that can have a dramatic effect on resolution of the lesions.

Note: See other forms of lichen planus in the earlier Red and Purple Lesions section.

Nicotine Stomatitis

Etiology

Nicotine stomatitis is caused by heavy smoking, particularly in pipe and cigar smokers. The irritation from heat and combustion products stimulates increased production of new epithelial cells resulting in hyperkeratosis (thickening of the layer of keratin on the epithelium) of the mucosal surface of the palate. The severity of tissue changes is directly associated with the intensity and duration of smoke exposure.

Not Transmissible

Location

Nicotine stomatitis is usually found on the buccal mucosa and in exposed palatal regions that contain minor salivary glands.

Clinical Characteristics

When the palate is affected it becomes erythematous, progressing to a grayish-white appearance that is secondary to hyperkeratosis. The excretory duct openings of the minor salivary glands become dilated and inflamed, resulting in multiple discrete keratotic papules with depressed red centers.

Dental Indications

The presence of this lesion in patients can be used as an educational opportunity for smoking cessation.

Treatment

Smoking cessation usually results in regression of the lesion.

Pseudomembranous Candidiasis

Etiology

The cause of candidiasis is *Candida albicans*. The following factors predispose individuals to candidiasis infections: antibiotic therapy, steroids, smoking, xerostomia, immune disorders, chemotherapy, or diabetes mellitus.

Transmission

Candida infections are not easily transmittable to another individual unless that person is immunocompromised.

Location

Candidiasis can occur on mucosal surfaces such as the palate, buccal mucosa, tongue, or pharyngeal area.

Clinical Characteristics

Candidiasis presents as multiple, raised, whitish, curdlike plaques that upon scraping reveal a red, raw, or bleeding mucosal surface. The distinguishing characteristic of this type

of candidiasis is that the plaques can be wiped off, thus the term **pseudomembranous**.

Symptoms

The patient with pseudomembranous candidiasis may complain of a burning sensation, tenderness, or sometimes pain around the affected mucosa. Spicy and acidic foods will cause occasional discomfort because of the increased sensitivity of the affected mucosa.

Dental Indications

Diagnosis is made by clinical examination, fungal culture, or microscopic examination of tissue scrapings. Linking this infection with the patient's disease status is important, particularly if the patient presents with any signs of an undiagnosed disorder.

Treatment

Treatment includes the prescribing of antifungal medications. Topical application or systemic drug therapy usually produces resolution.

Instrument Design Characteristics

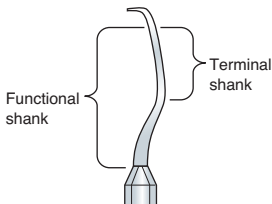
Shank

Functional Shank

- The functional shank is used for proper adaptation of the instrument to the tooth surface.
- It is located between the end of the handle and the working end.

Terminal Shank

- The terminal shank is used to establish correct angulation and working end for proper instrumentation.
- It is the last section before the working end.



Simple Shanks

- Simple shanks bend in one plane.
- Are used in the anterior or for buccal and lingual surfaces posteriorly.



Complex shanks

- Complex shanks have multiple bends in more than one plane.
- Increase access to posterior surfaces.
- Generally adaptable to anterior and posterior surfaces.



Shank Strength

- Instrument shanks are available in varying degrees of flexibility.
- Highly flexible instruments offer increased tactile sensitivity; tactile sensitivity is reduced as the shank becomes more rigid.
- Moderately flexible shanks are recommended for light to moderate calculus removal.
- Rigid shanks are recommended for moderate to heavy calculus removal.
- Selection of the appropriate shank design increases efficiency, safety, and decreases operator fatigue.

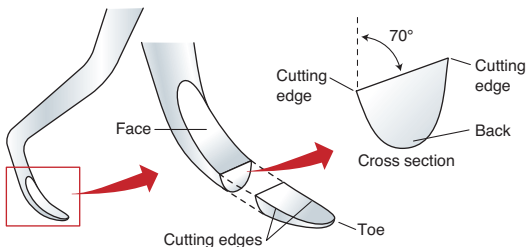
Working End

The working end is the portion of the instrument that carries out the function of the instrument. The working end begins where the terminal or lower shank ends. The design of each working end is specific to the intended use of the instrument.

Area-Specific Curette

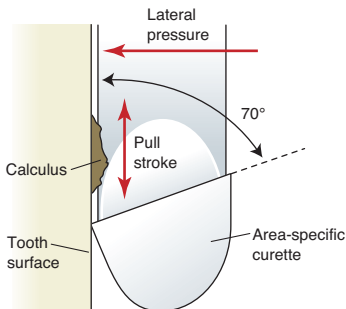
Working End

- Semicircular in cross section.
- Face of the instrument meets the terminal shank at a 70° angle.
- Area-specific curettes must be used in sets to complete debridement of the entire dentition.
- Used in subgingival and supragingival areas on selected tooth surfaces.



Stroke and Adaptation

- Adapt toe third of the instrument with the lower cutting edge toward the tooth surface.
- Terminal shank is parallel to the long axis of the tooth.
- Instrument face-to-tooth angulation is between 60° and 80° .
- Activate by using a pull stroke.



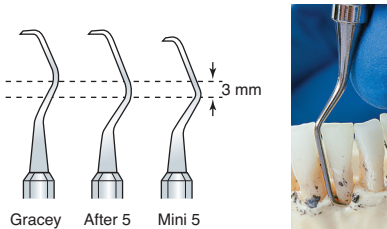
Application of Area-Specific Curettes

Gracey Curette	Area of Use
Gracey 1/2 Gracey 3/4	Anterior teeth all surfaces
Gracey 5/6	Anterior/premolar teeth all surfaces Molar teeth buccal and lingual surfaces
Gracey 7/8 Gracey 9/10	Posterior teeth buccal and lingual surfaces
Gracey 11/12 Gracey 15/16	Posterior teeth buccal, lingual, and mesial surfaces
Gracey 13/14 Gracey 17/18	Posterior teeth buccal, lingual, and distal surfaces

Modified Area-Specific Curettes

- Area-specific curettes are available with variations of extended terminal shanks and shortened working ends.
- The extended shank allows for enhanced access into deeper periodontal pockets and teeth with severe recession.

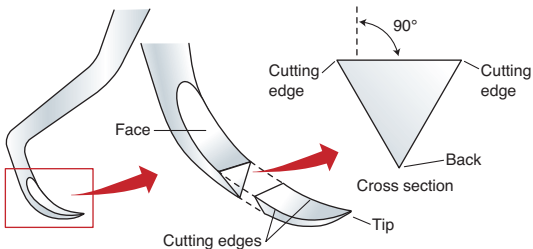
- Shortened working ends provide ideal access in narrow pockets.



Scaler (Sickle/Straight)

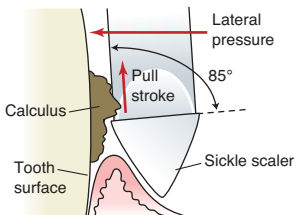
Working End

- Triangular in cross section.
- Face of the instrument meets the terminal shank at 90° .
- Used in supragingival area.



Stroke and Adaptation

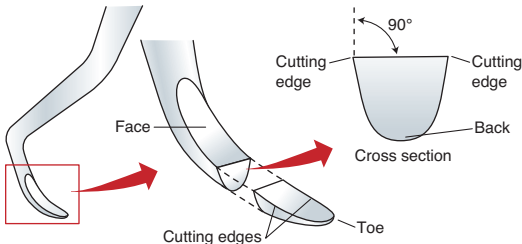
- Adapt tip third of the instrument to the tooth surface.
- Terminal shank is tilted slightly toward the tooth surface.
- Instrument face-to-tooth angulation is between 60° and 90° .
- Activate by using a pull stroke.



Universal Curette

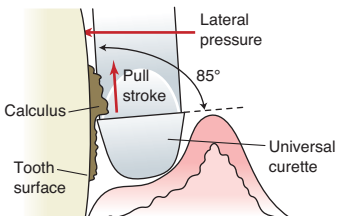
Working End

- Semicircular in cross section.
- Face of the instrument meets the terminal shank at a 90° angle.
- Used in subgingival and supragingival areas on all tooth surfaces.



Stroke and Adaptation

- Adapt toe third of the instrument to the tooth surface.
- Terminal shank is tilted slightly toward the tooth surface to prevent trauma to adjacent tissue.
- Activate by using a pull stroke.



Langer Curettes

- Langer curettes combine the working end of a universal curette with shank designs similar to those of area-specific curettes.
- A set of four is recommended for debridement of the entire mouth.

Stroke and Adaptation

- Adapt toe third of the instrument to the tooth surface.
- Terminal shank is tilted slightly toward the tooth surface to prevent trauma to adjacent tissue.
- Activate by using a pull stroke.

Langer Curette	Area of Use
1/2 Langer	Mandibular posterior all surfaces
3/4 Langer	Maxillary posterior all surfaces
5/6 Langer	Anterior all surfaces
17/18 Langer	Posterior all surfaces



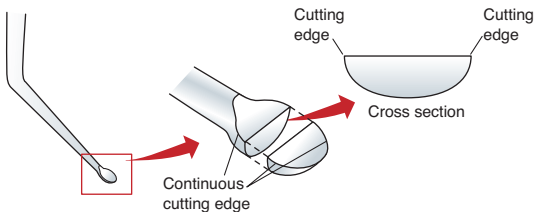
Langer curette.

O'Hehir Debridement Curette

- O'Hehir curettes are designed to remove light deposits from the root surface.

Working End

- Disk-shaped cutting edge.
- Extended terminal shank increases access into deep periodontal pockets.
- Used for assessment and smoothing of root surfaces, furcations, developmental grooves, and line angles.



Stroke and Adaptation

- Entire rim is the cutting edge.
- Used with a light exploratory stroke.
- Active in both a push and pull motion.



O'Hehir.

DiamondTec File Scalers Mesial/Distal Design

- DiamondTec File Scalers are used for the removal of fine or embedded calculus in furcations and root depressions.

Working End

- 360° medical-grade diamond coating.
- Provides access to small and narrow pockets.
- Mesial end: Concave.
- Distal end: Convex.

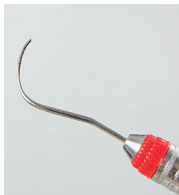


Stroke and Adaptation

- Active in both a push and pull motion.
- Adaptable to line angles and deep developmental grooves.

DiamondTec File Scaler Naber's Design**Working End**

- Paired ends R/L.
- Universal application.
- Extended shank and pronounced curvature.

**Stroke and Adaptation**

- Access for Class III furcations.
- Active in both a push and pull motion.
- Adaptable to line angles and deep developmental grooves.

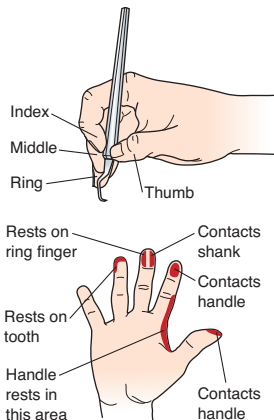


Periodontal Instrumentation

Grasp and Fulcrum

Modified Pen Grasp and Fulcrum

- Provides control and stability of the instrument.
- Allows for a wide range of motion and provides a high degree of tactile sensation for the operator.
- The pads of the thumb and index finger are placed opposite each other on the instrument handle.
- The pad of the middle finger is kept in contact with the upper portion of the functional shank.
- The ring finger is placed on tooth structure to provide support and leverage during instrumentation.
- All fingers should remain in contact and the wrist in neutral position throughout instrumentation.



Alternative and Advanced Fulcrum Techniques

- Alternative and advanced fulcrum techniques rely on variations of the modified pen grasp and fulcrum to provide increased access to difficult-to-reach areas.
- In general, although these techniques provide superior access they offer less control and stability.

Finger-on-Finger Fulcrum

- Allows the terminal shank to be parallel with the tooth surface when accessing deep periodontal pockets.
- Index finger of nondominant hand is positioned near the area of instrumentation.
- The fulcrum of the dominant hand is positioned on the index finger.



Cross Arch Fulcrum

- Allows for increased access when the patient has a small mouth or the range of opening is limited.
- Placement of the fulcrum is in the same arch, opposite the area of instrumentation.



Opposite Arch Fulcrum

- Allows the terminal shank to be parallel with the tooth surface when accessing deep periodontal pockets.
- The fulcrum rest is established in the arch opposite the area of instrumentation.



Reinforced Fulcrum

- Provides increased lateral pressure for the removal of tenacious deposits.
- The index finger of the nondominant hand is placed against the shank of the instrument and lateral pressure is applied during activation.
- This technique can be combined with standard intraoral or extraoral fulcrum techniques.



Extraoral Fulcrum

- Allows for increased access when the patient has a small mouth or the range of opening is limited.
- The ability to maintain a relaxed grasp offers increased tactile sensitivity.
- The knuckles of the operator's hand rest against the patient's chin or the hand cups the chin depending on the area of instrumentation.



Instrumentation Strokes

Assessment Strokes

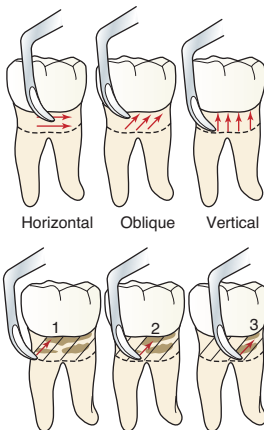
- Assessment strokes are used to evaluate the tooth surface for deposits and root irregularities.
- Assessment strokes are best achieved by holding the instrument with a light grasp and applying minimal lateral pressure against the tooth surface.
- Strokes should extend from the base of the sulcus/pocket to the gingival margin.
- Periodontal explorers and curettes may be used with assessment strokes; using assessment strokes with curettes during calculus debridement increases efficiency, the definitive assessment is best performed with a periodontal explorer.

Calculus Removal Strokes

- The lateral pressure applied to the tooth during the debridement of calculus varies depending on the tenaciousness of the deposit.
- Adequate pressure must be applied to fracture the calculus from the tooth and prevent burnishing or incomplete removal.
- Strokes are short and controlled.
- Each stroke should slightly overlap the previous to ensure complete removal of deposits.

Periodontal/Root Debridement Strokes

- Periodontal or root debridement strokes are used to remove residual or embedded calculus, subgingival dental biofilm, and endotoxins from the root surface.
- Thorough debridement of the root surface is achieved by implementing a variety of instrumentation strokes.



- The three primary stroke directions include horizontal, vertical, and oblique; they are used in combination to produce the most effective outcome.
- The lateral pressure applied to the root surface is generally lighter than that used for calculus removal to prevent excess removal of tooth structure.
- The length of the root debridement stroke is longer than the calculus removal stroke to achieve a smooth, even surface.

Technique Modifications for Difficult-to-Access Areas

Distal Concavities

- Use the lower cutting edge of a Gracey $^{13}_{14}$ with the toe positioned for a horizontal stroke.
- Use short controlled overlapping strokes.



Buccal Concavities

- Use the lower cutting edge of a Gracey $^{11}_{12}$ or Gracey $^{7}_{8}$ with the toe positioned for a horizontal stroke.
- Use short controlled overlapping strokes.



Linguoverted Mandibular Anterior Teeth

- Use the lower cutting edge of a Gracey $13/14$ with the toe positioned for a vertical stroke.
- Use short overlapping strokes, switch working ends for surfaces toward and away from the operator.



Instrument Sharpening

Safety and Efficacy

- Routine sharpening maintains the integrity of the instrument for its intended use.
- Sharpening routinely with light pressure will preserve the life of the instrument longer than infrequent sharpening, which requires more contouring and loss of metal.
- Sharpening methods should preserve the original design of the instrument.
- Sharp instruments will increase the quality of debridement.
- Operator fatigue is decreased when sharp instruments are used.
- The risk of injury is reduced as sharp instruments grip the tooth surface and are less likely to slip.
- Sharp instruments decrease the time and pressure needed for debridement, increasing patient comfort.
- Whenever possible sharpen instruments with a sterile stone immediately before use to reduce the risk of exposure.

Armamentarium

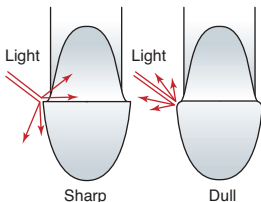
- Sharpening stone.
- Lubricant (mineral oil or water).
- Acrylic test stick.
- Light.
- Gauze.

Assessing the Need for Sharpening During Treatment

- The instrument will not “grip” the tooth surface.
- Tactile sensitivity is reduced.
- Increased lateral pressure is required for debridement.

Testing Stick

- Using an acrylic test stick, adapt the cutting edge of the instrument as it would be positioned for scaling.
- Apply lateral pressure to the acrylic test stick, a sharp instrument will “grip” the stick, a dull cutting edge will slip.

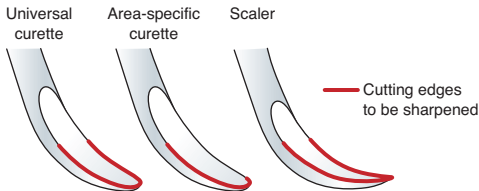


Light

- Holding the instrument with the cutting edge in the beam of the dental light, tilt the instrument back and forth slightly.
- A dull cutting edge will reflect light.

Sharpening Curettes and Scalers

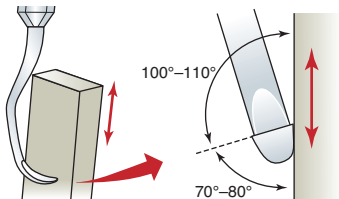
- The areas of the cutting edge to be sharpened varies among scalers, curettes, and universal curettes.



Sharpening Methods

Stationary Instrument Moving Stone

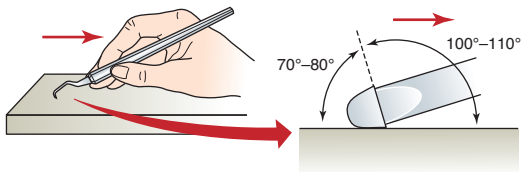
- Apply water or lubricant to the stone according to manufacturer's recommendations.
- Grasp the instrument using a palm grasp with the nondominant hand.
- Rest the side of the palm against the side of a counter or other nonmovable surface.
- Position the face of the instrument so that it is parallel with the floor.
- Position the sharpening stone with the dominant hand so that it forms a right angle with the face of the instrument.
- Tilt the stone slightly away from the face of the instrument to create an angle of 110° .
- Beginning at the heel third of the instrument apply light pressure against the instrument with the stone.
- Move the stone up and down against the cutting edge using approximately 1-inch strokes.
- Maintain the 110° angle throughout the process using slightly more pressure on the down stroke.
- For each section that is sharpened, use approximately three strokes, ending on a down stroke.
- Advancing the stone a millimeter at a time, continue to work toward the toe third of the instrument repeating the same technique.
- To maintain the rounded back of cures, the stone can be turned to follow the curve of the back of the instrument on the last stroke of each section.
- After the cutting edge is sharpened, use a cylindrical stone or the narrow edge of the sharpening stone to remove wire edges formed during the sharpening process; this is accomplished by gently moving the stone over the face of the instrument two to three times.
- Assess for sharpness with a test stick or light.
- Repeat the process as needed.
- Remove any debris from sharpening with a sterile gauze before use.



Stationary Stone Moving Instrument

- Apply water or lubricant to the stone according to manufacturer's recommendations.
- Place the stone on a flat surface and secure with the nondominant hand.
- Hold the instrument with a modified pen grasp placing the cutting edge to be sharpened against the stone, maintain a finger rest against the stone.
- Adjust the face of the instrument until a right angle is formed between the face of the instrument and the stone.
- Raise the instrument slightly to create an angle of 110° .
- Beginning with the heel third of the instrument, apply light pressure against the stone.
- Pull the instrument over the stone moving the entire hand to ensure that the 110° angle is maintained.
- Complete two to three strokes for each section of the cutting edge gradually working from heel to toe.
- To maintain the rounded back of cures, the instrument can be gradually raised during the last stroke of each section.
- To maintain the rounded toe of the instrument, gradually roll from one side to the other during the stroke.
- After the cutting edge is sharpened, use a cylindrical stone or the narrow edge of the sharpening stone to remove wire edges formed during the sharpening process; this is accomplished by gently moving the stone over the face of the instrument two to three times.
- Assess for sharpness utilizing a test stick or light.

- Repeat the process as needed.
- Remove any debris from sharpening with a sterile gauze before use.



Power Driven Scaling Devices

Power scaling in conjunction with manual periodontal debridement is recommended for optimum deposit removal.

Ultrasonic Scalers

There are two types of ultrasonic scaling devices—magnetostrictive and piezoelectric.

Magnetostrictive

- Magnetostrictive units use metal stacks in the handpiece.
- When an electric current is applied, it causes the functioning tip of the instrument to vibrate.
- Insert tip moves in an elliptical motion.
- All sides of the insert tip are active.

Piezoelectric

- Piezoelectric units are equipped with ceramic rods in the handpiece.
- The unit is activated by dimensional changes in metal alloy crystals or quartz, which are located in the handpiece.
- The insert tip moves in a linear pattern.
- Only 2–3 mm of the terminal lateral sides of the insert tip are active.

Sonic Scalers

Sonic scalers

- Composed of a handpiece that attaches to the dental unit.
- Interchangeable scaling tips.
- The scaler is driven by compressed air.
- The insert tip moves in an elliptical motion.
- All sides of the tip are active.

Power Scaling Advantages	Power Scaling Disadvantages
• Safe efficient calculus removal • Detoxify root surfaces/ bactericidal • Increased access to periodontal pockets and furcations • Lavage • Preservation of tooth structure • Less operator fatigue • Less instrumentation time • Easier adaptation	• High aerosol production • Decreased tactile sensitivity • Decreased visibility • Root gouging

Indications for Use

- Removal of supragingival calculus and stain.
- Subgingival periodontal debridement and irrigation.
- Furcations, removal of orthodontic cement, overhangs.

Contraindications for Use

- Communicable disease.
- Children.
- Cardiac pacemaker/implanted cardiac device.
- Patients susceptible to infection (HIV, organ transplant patients).

- Respiratory or pulmonary disease or difficulty breathing.
- Use caution with patients wearing hearing aids, water from the ultrasonic scaler may cause damage to the hearing device.
- Severe gag reflex.
- Demineralized areas.
- Exposed dentinal surfaces.
- Restorative materials.
- Titanium implants.

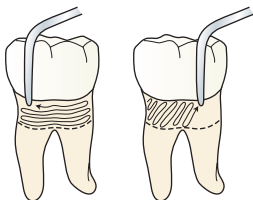
Techniques for Use

- Have patient use a preprocedural rinse to reduce bacteria levels.
- Power level.
 - Avoid high settings.
- Water.
 - Flush for 3 minutes at the beginning of the day, and for 30 seconds between patients.
 - A light mist or halo effect.
- Insert/Tip selection.

Insert/Tip	Accretions/Area of Use
Standard	Moderate to heavy deposits supragingival and in narrow pockets
Straight Slim	Light to moderate calculus in the anterior and posterior pockets <5 mm
Curved Slim	Light to moderate calculus in posterior pockets >4 mm
Furcation Slim	Class II and Class III furcation involvement
Implant	Biofilm and calculus removal around titanium implants and abutments

- Patient chair position.
 - Normal/supine.
- Patient head position.
 - Turned to the right or left.

- Retraction.
 - Cup the lip or cheek to contain the water spray inside the patients mouth.
- Suction.
 - High-volume suction tip to minimize aerosols
- Adaptation.
 - Side of the tip parallel to the long axis of the tooth
- Grasp.
 - Light, relaxed.
- Stroke direction.
 - Overlapping, multidirectional, sweeping, erasing type motion.



- Stroke technique.
 - Keep tip moving at all times.
 - Constant motion, heavy deposits will take several minutes.

Glossary

Diseases/Conditions

Addison's disease: A rare endocrine disorder in which the adrenal glands produce insufficient steroid hormones.

Alzheimer's disease: A progressive neurological disease resulting in irreversible dementia.

Anemia: A reduction in the number of red blood cells to a level below normal.

Arthritis: Pain, stiffness, and swelling caused by joint inflammation.

Asperger's syndrome: Pervasive developmental disorder that impairs one's ability to socialize and communicate effectively.

Autism spectrum disorders: Complex developmental disability limiting one's ability to communicate.

Behçet's disease: A rare multisystem disease resulting in inflammation of the blood vessels characterized by ulcers in the mouth, on the genitals, and inflammation around the eye.

Bell's palsy: Acute onset of unilateral paralysis or weakness of the facial nerve.

Bipolar disorder: Major mental disorder characterized by episodes of mania and depression or mixed mood.

Bronchitis: Inflammation of the bronchial airways.

Celiac disease: Digestive disorder caused by intolerance to gluten.

Cerebral palsy: A general term describing nonprogressive motor impairments resulting in physical disabilities.

Cerebrovascular accident (stroke): Acute impairment of cerebrovascular circulation causing a loss of brain function.

Christmas disease: Hemophilia due to a Factor IX deficiency.

Cretinism: Stunted physical and mental growth due to a congenital deficiency of thyroid hormones.

Crohn's disease: An incurable, chronic inflammatory disease of the intestines.

- Cushing's disease:** A hormone disorder characterized by excessive cortisol in the blood or by the administration of glucocorticosteroids in large doses for several weeks.
- Cystic fibrosis:** A complex genetic disorder that involves the pancreas, liver, and lungs in which mucus secretion obstructs passages to these organs.
- Degenerative joint disease:** Osteoarthritis, caused by progressive arthritis affecting the weight-bearing joints.
- Diverticulitis:** Inflammation of the diverticula (sac present along the wall of the colon) responsible for abdominal pain.
- Down syndrome:** Congenital condition characterized by degrees of mental retardation; chromosomal abnormality due to an extra 21 chromosome, Trisomy 21.
- Emphysema:** Chronic respiratory disease in which the alveoli are overinflated resulting in decreased lung function.
- Encephalitis:** Acute inflammation of the brain.
- Epilepsy:** A physical condition in which abnormal discharges in the brain result in recurrent seizures.
- Epstein-Barr virus:** The herpes virus responsible for infectious mononucleosis and various types of cancer.
- Evans syndrome:** An autoimmune disease in which one's red blood cells and platelets are attacked by their own antibodies.
- Fetal alcohol syndrome:** Birth defects in an infant caused from alcohol consumption of the mother during gestation.
- Fibromyalgia:** Widespread chronic pain in muscles, tendons, and soft tissue surrounding the joints.
- Fragile X syndrome:** A genetic syndrome that results in mental impairment.
- Gastroesophageal reflux disease (GERD):** Chronic symptoms caused by an abnormal reflux in the esophagus resulting in heartburn.
- Glaucoma:** A group of eye diseases characterized by optic nerve damage due to elevated pressure within the eye.
- Gout:** A form of arthritis resulting from elevated uric acid in the blood and the deposition of urate crystals around the joints.

- Graves' disease:** An autoimmune disease that affects the thyroid gland resulting in hyperthyroid symptoms.
- Hashimoto's disease:** An autoimmune disorder in which the body's immune system develops antibodies against its own thyroid gland, resulting in hypothyroidism.
- Hodgkin's disease:** A malignant disorder of the lymphoid tissue.
- Impetigo:** A highly contagious skin infection, common in children, that usually occurs around the nose and mouth; fluid-filled blisters burst, leaving moist weeping areas.
- Irritable bowel syndrome:** Intermittent abdominal pain and irregular bowel habits (constipation, diarrhea, or both).
- Kawasaki disease:** A childhood illness, characteristics include fever, conjunctivitis, and swollen lymph glands; as the illness progresses the palms and soles become red and swollen.
- Lactose intolerance:** Inability to digest lactose, a sugar found in milk and milk products; resulting in gas, bloating, and diarrhea.
- Lou Gehrig's disease (amyotrophic lateral sclerosis):** A progressive neurodegenerative disease of the nerve cells in the brain and spinal cord.
- Lupus erythematosus:** An autoimmune, chronic, disease causing inflammation of the connective tissue; the more common type, discoid lupus erythematosus, affects exposed areas of the skin; the more serious and potentially fatal systemic lupus erythematosus affects many systems of the body.
- Lyme disease:** An infectious disease contracted by a tick bite.
- Lymphoma:** Any group of cancers in which the cells of the lymphoid tissue are affected.
- Marfan syndrome:** An inherited disorder that results in abnormalities of the skeleton, heart, and eyes; individuals grow very tall and thin, the fingers are long and spidery.
- Multiple sclerosis:** Progressive disease of the central nervous system.
- Muscular dystrophy:** An inherited muscle disorder in which there is a slow but progressive degeneration of muscle fibers.

- Myasthenia gravis:** A disorder in which the muscles become weak and tire easily.
- Non-Hodgkin's disease:** A malignant disorder of the lymphoid tissue.
- Paget's disease:** Normal process of bone formation is disrupted, causing the affected bones to weaken, thicken, and become deformed; usually occurring in middle-aged people or the elderly.
- Parkinson's disease:** A brain disorder that causes muscle tremor, stiffness, and weakness.
- Polycystic kidney disease:** An inherited disorder in which numerous cysts are present in both kidneys; the cysts gradually increase in size until most of the normal kidney tissue is destroyed.
- Polycystic ovary (Stein Leventhal syndrome):** Scanty or absent menstruation, infertility, hirsutism, and obesity.
- Psoriasis:** A noncontagious, chronic autoimmune disease that affects the skin.
- Raynaud's syndrome:** A disorder of the blood vessels that causes the arteries that supply the fingers and toes to constrict.
- Reiter's syndrome:** An arthritic disorder of adult males; it affects ankles, feet, and sacroiliac joints and is also associated with conjunctivitis and urethritis.
- Restless leg syndrome:** Unpleasant tickling, burning, pricking, or aching sensations in the muscles of the legs.
- Rett syndrome:** A progressive syndrome of autism, dementia, ataxia, and abnormal hand movements.
- Reye syndrome:** Encephalopathy following an acute febrile illness, strongly associated with the use of aspirin in infants and young children.
- Scabies:** A highly contagious skin infestation caused by a mite.
- Scleroderma:** Symptoms include Raynaud's phenomenon, skin becomes thickened, tight, and waxy; puckering around the mouth is common.
- Shingles (herpes zoster):** A painful rash usually occurring unilaterally on the trunk.

Sjögren's syndrome: A condition in which the eyes, mouth, and vagina become excessively dry.

Vitiligo: Disorder of skin pigmentation where patches of skin lose their color.

Common Dental Terminology

Abfraction: V-shaped cervical lesion due to parafunctional movements.

Abrasion (gingival): Mechanical removal of surface epithelium.

Abrasion (tooth): Loss of structure by mechanical wear.

Abutment: Tooth or implant used for support.

Ankylosis: Rigid fixation of a tooth to the surrounding alveolus.

Arrested caries: Post remineralization, the caries process is halted.

Attrition: Wearing away of tooth structure.

Auscultation: Listening for sounds produced within the body.

Avulsion: Separation of a tooth from the alveolus.

Bulla: Blister of the skin or mucous membrane, containing clear fluid, >1 cm in diameter.

Bruxism: Grinding, clenching, or clamping of the teeth.

Cavitation: Final stage in the caries process.

Centric relation: Unstrained, retruded physiological contact of the mandible to the maxilla from which lateral movements can be made.

Chancre: Also called a venereal sore; red, bloodless, painless ulcer.

Crepitus: Feel or sound of crackling.

Dehiscence: Cleftlike absence of the alveolar bone; resulting in a denuded root surface.

Demineralization: Minerals dissolved from tooth by acids formed from acidogenic bacteria.

Denudation: Surgical or pathological removal of epithelium covering, seen in median rhomboid glossitis.

Diastema: Space between two adjacent teeth.

Dysphasia: Difficulty in swallowing.

Dyspnea: Shortness of breath.

Edentulous: Without teeth.

Erythema: Red area.

Exfoliation: The shedding of primary teeth.

Exostosis: Benign bony growth.

Exudate: Fluid, cells, and cellular debris, usually a result of inflammation.

Facet: Small flattened surface.

Fenestration: Root denuded of bone when marginal bone is intact.

Fetor oris: Offensive odor from the mouth.

Fremitus: A vibration felt by palpation.

Glossodynia: Pain in the tongue.

Hemostasis: Termination of bleeding by chemical or mechanical means.

Hyperplasia: Abnormal increase in volume of tissue caused by formation and growth of new normal cells.

Idiopathic: Unknown etiology.

Korotkoff sound: The sounds heard when determining blood pressure.

Lavage: Flushing with large amounts of fluid.

Luxation: A dislocation.

Necrosis: Cell death.

Nidus: Point of origin.

Obturator: Prosthesis used to close a congenital or acquired opening.

Para functional: Abnormal or deviated function, such as bruxism.

Pontic: Artificial tooth that replaces a natural tooth usually between two abutments.

Purulent: Containing, forming, or discharging pus.

Radiolucency: The appearance of dark images on a radiograph.

Radiopacity: The appearance of light images on a radiograph.

Rampant caries: Rapidly progressing caries occurring in many teeth.

Remineralization: Minerals deposited into demineralized areas.

Secondary caries: Caries occurring at the margins of existing restorations, also called recurrent caries.

Subluxation: Incomplete dislocation of a joint.

Succedaneous: Permanent teeth that erupt into the positions of exfoliated primary teeth.

Suppuration: Formation of pus.

Trismus: Difficulty opening the mouth due to spasm of the masticatory muscles.

Xerostomia: Dry mouth.

Spanish Terminology

Medical Questions

What is your physician's name and phone number?

¿Qué es el nombre de su médico y el número de teléfono?

Are you taking any medications? If so, what?

¿Toma medicina? ¿Si eso es el caso, qué?

Do you have any heart problems?

¿Tiene algunos problemas cardíacos?

Do you have high blood pressure?

¿Tiene la hipertensión?

Do you have diabetes?

¿Tiene la diabetes?

Do you have any allergies?

¿Tiene algunas alergias?

Are you allergic to any medications?

¿Es alérgico a medicina?

Do you have to take antibiotics before dental treatment?

¿Tiene que tomar antibióticos antes de tratamiento dental?

Have you recently been hospitalized?

¿Ha sido hospitalizado recientemente?

Dental Questions

When was your last dental visit?

¿Cuándo fue su última visita dental?

Are you having any problems with your teeth?

¿Tiene cualquier problemas con los dientes?

Do you have any pain?

¿Tiene dolor?

How often do you brush?

¿Con qué frecuencia se cepilla?

How often do you floss?

¿Con qué frecuencia se limpia con hilo dental?

Do your gums bleed when you brush, floss, or eat?

¿Sangran sus gomas cuando se cepilla, limpia con hilo dental o come?

When were your last dental x-rays?

¿Cuándo fueron sus últimas radiografías dentales?

Is there anything that you would like to discuss with the dentist?

¿Hay algo que usted querría discutir con el dentista?

Treatment Directives

Open your mouth

Abra la boca

Close your mouth

Cierre la boca

Swish and spit

Mueva y escupa

Swallow

Trague

Close your teeth together

Cierre los dientes juntos

Bite down

Muerda hacia abajo

Chin up

El mentón arriba

Web Resources

Antibiotic Prophylaxis

American Academy of Orthopaedic Surgeons

<http://www.aaos.org/about/papers/advistmt/1033.asp>

American Dental Association

<http://www.ada.org/2157.aspx?currentTab=2>

American Heart Association

<http://www.americanheart.org/presenter.jhtml?identifier=11086>

Blood Pressure Classifications*American Heart Association*<http://www.americanheart.org/presenter.jhtml?identifier=2112>**Drugs***Medline Plus*<http://www.nlm.nih.gov/medlineplus/druginformation.html>*PDRhealth*<http://www.pdrhealth.com/drugs/rx/rx-a-z.aspx>*RxList*http://www.rxlist.com/drugs/alpha_a.htm*U.S. Food and Drug Administration*<http://www.accessdata.fda.gov/scripts/cder/drugsatfda/>**Health Information***Mayo Clinic*<http://www.mayoclinic.com>*Medline Plus*<http://medlineplus.gov>*MerckSource*<http://www.mercksource.com>*WebMD Health*<http://www.webmd.com>**Infection Control***American Dental Association*<http://www.ada.org/1857.aspx>*Centers for Disease Control and Prevention*<http://www.cdc.gov/OralHealth/infectioncontrol>*National Institute for Occupational Safety and Health*<http://www.cdc.gov/niosh/topics/bbp>*Organization for Safety and Asepsis Procedures*<http://www.osap.org>*United States Department of Labor Occupational Safety & Health Administration*<http://www.osha.gov/SLTC/dentistry/index.html>

Oral Pathology

National Cancer Institute

<http://www.cancer.gov/cancertopics/types/oral>

Oral Pathology Database, University of Iowa College of Dentistry

<http://www.uiowa.edu/~oprm/AtlasHome.html>

Virginia Commonwealth University

<http://www.library.vcu.edu/tml/oralpathology>

Patient Education

Colgate Professional

<http://www.colgateprofessional.com/patienteducation>

GlaxoSmithKline

<http://www.dental-professional.com/Patient.aspx>

Oral-B

<http://www.oralb.com/topics>

The Procter & Gamble Company

<http://www.dentalcare.com/en-US/patient/english/menu.jsp>

Radiographic Guidelines

American Dental Association

<http://www.ada.org/2760.aspx?currentTab=2>

Tobacco Cessation

American Dental Association

<http://www.ada.org/2615.aspx?currentTab=2>

American Dental Hygienists' Association

<http://www.askadviserefer.org>

Centers for Disease Control and Prevention

<http://www.cdc.gov/tobacco>

Smokefree

<http://www.smokefree.gov>

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